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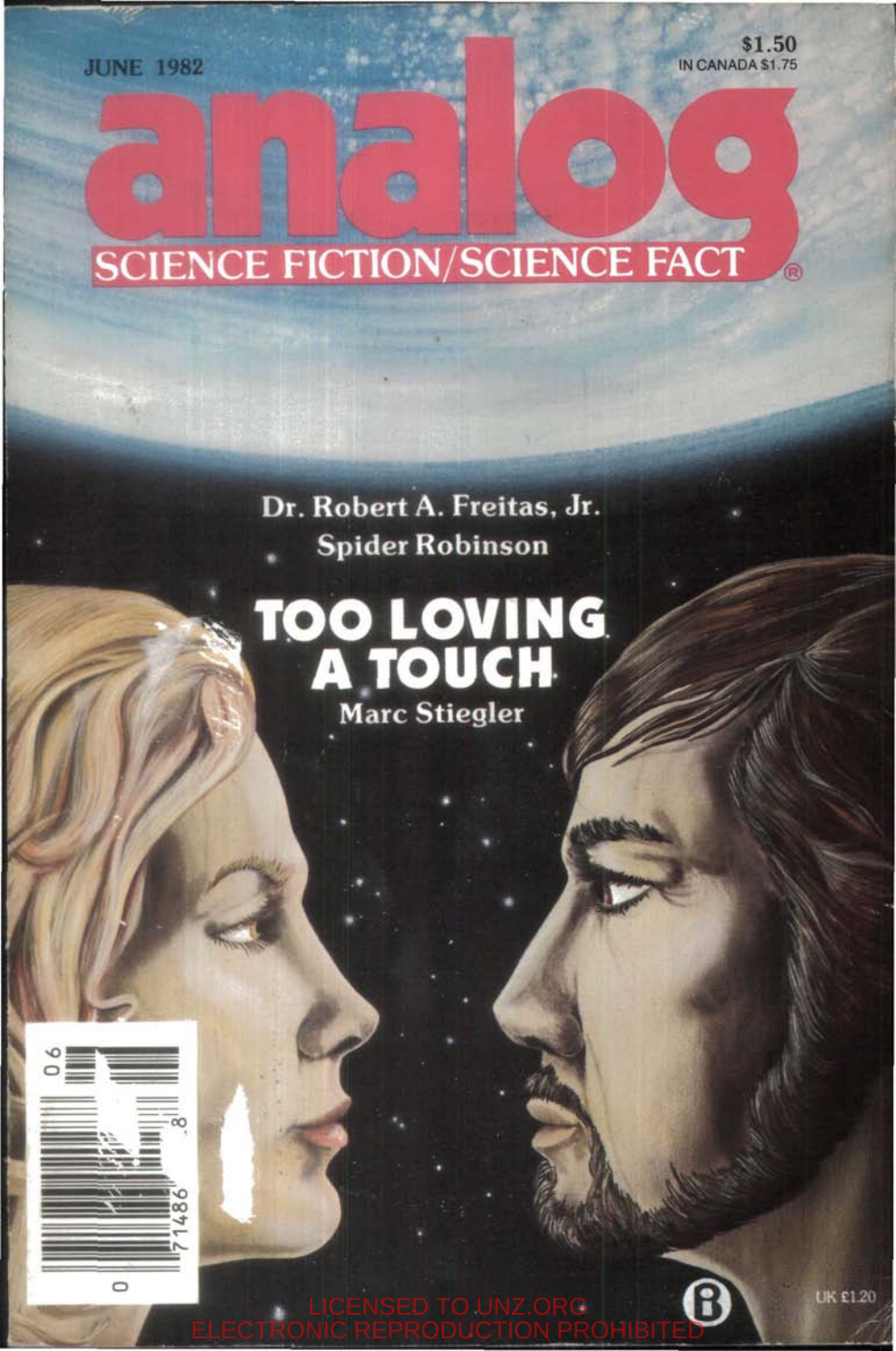

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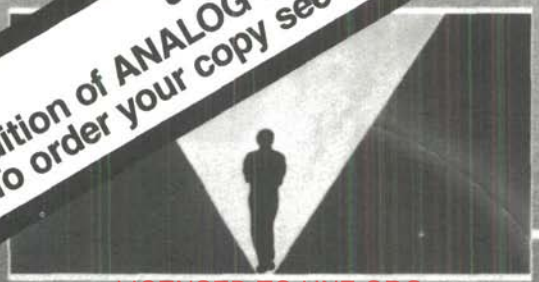

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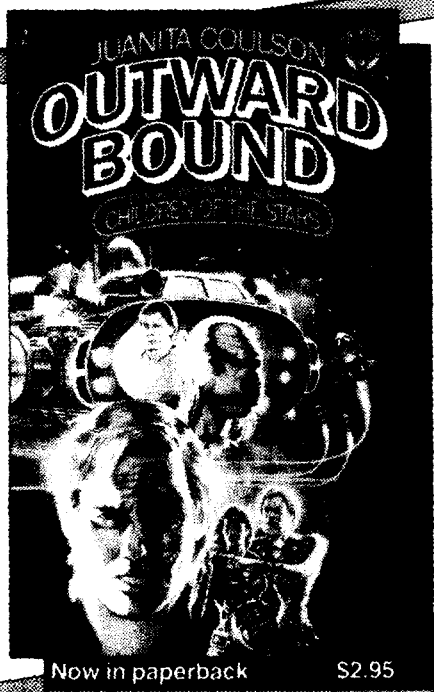

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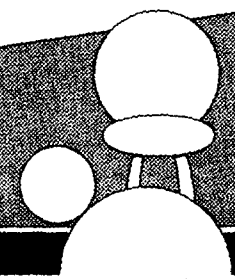

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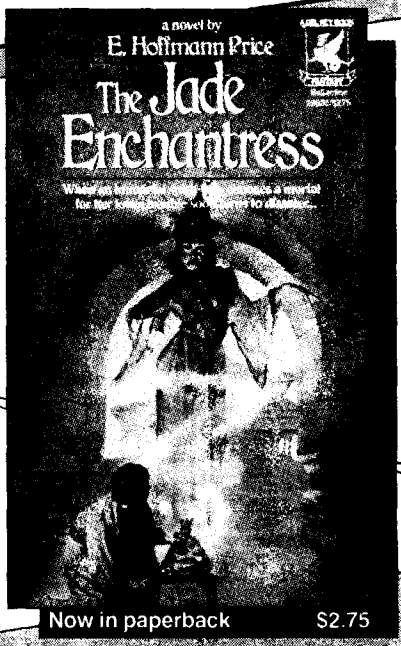

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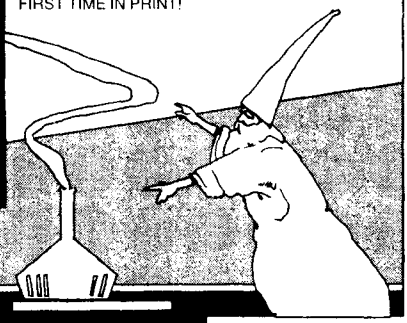

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Editorial

RENAISSANCE

by Stanley Schmidt

We are in the midst of a renaissance.

The signs are all around us. Some of them are signs in the literal sense, like the one I saw on a bulletin board in a supermarket near home advertising, "Hand healing without touching." Or the ones which have been proliferating in midtown Manhattan, near the *Analog* offices, advertising palmists, tea leaf readers, and other kinds of fortune tellers for every taste. They've been there all along—but their numbers, and presumably their popularity, are conspicuously increasing.

Go into any newsstand and look at the number of prominently displayed magazines on UFOs and astrology. Not, mind you, journals suggesting that there may be phenomena or correlations which we do not understand and would do well to investigate (as we suggest from time to time in *this* magazine), but magazines with *Answers*, which people use quite seriously as guides to every aspect of their lives. Read the headlines on the best-selling tabloids at your supermarket checkout; after just a few, they'll all begin to sound very familiar.

After the temporary setback of the Scopes trial in 1925, creationism —"scientific" creationism, yet—is making a galloping comeback. As I write this, it has already been legislated back onto an equal footing with the theory of evolution in the schools of at least one state, and is under very serious consideration in several more. A recent poll of adults throughout the United States indicated that three out of four believe that creationism and evolution *should* be given equal respect and emphasis.

Well . . . did anybody say a renaissance has to be a Good Thing? A renaissance is nothing more or less than a rebirth, a flowering of something which has been dormant for a while.

We are undergoing a Renaissance of Superstition—and to those of us who find that disturbing, perhaps the most disturbing part is the number of people who think that it *is* a good thing.

Why is it happening?

I have a theory. On the face of it, it's much like the one I've heard most often from others—but there's an important difference in the way I state it. There's an essential point which I think most commentators on the subject have overlooked—a key question they've forgotten to ask.

The usual explanation for the renaissance of superstition seems to be that a great many people have lost faith in science and technology. This, we are told, is a reaction to the realization in

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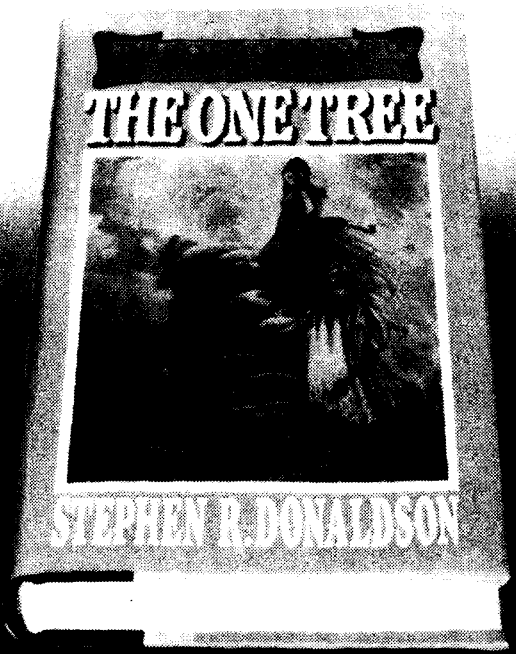

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recent decades, following on the heels of a period of unbounded optimism, that not all the answers we thought we had were complete or final, and that there are still problems to be solved. The loss of faith, viewed in this light, is a perfectly understandable thing.

And is it necessarily a *bad* thing?

Well, yes and no. Faith, after all, is a thing of limited utility. A certain amount of certain kinds can serve the valuable function of giving people the courage and confidence to go through with things they would not otherwise try. If you find a tool which shows itself to be capable of doing things which increase your strengths and capabilities within certain limits, it makes good sense to trust it enough to use it to do all it can, to get the maximum possible benefit from it. Science has shown itself to be such a tool, and they only hurt themselves who shrink from it and become fearful of using it as such. But blind faith in omniscience and infallibility is a trap (as the New Faithful of the current Renaissance may soon rediscover)—because any real tool, even science as practiced by human beings with human failings and finite lives, has limits to what it can do.

That, I think, is what has caused the widespread flight from science to superstition and mysticism. Scientists —most of them, anyway—have always recognized that their knowledge and capabilities have limits, that practical applications seldom approach theoretical ideals of performance, that theories themselves are subject to change and refinement as new data come to light. But the general public has *not* often recognized these things. It has looked to science and technology for easy answers, quick fixes, ultimate solutions that have no unpleasant side effects and will never have to be reconsidered. That period of unbounded optimism earlier in this century was perhaps too exuberant—or, more precisely, too uncritical. John Q. Public was all too willing to look to scientists and engineers as Those Who Had All the Answers (because they demonstrably had *some* of them), and to believe that since *they* had the answers, *he* didn't need to worry about them.

Maybe too many scientists were too willing to let him believe that. Scientists have sometimes been called "The New Priesthood," and the sense in which that phrase is truest is in reference to the public's attitudes toward them. In any case, when John Q. found that they *didn't* have all the answers—that drugs have side effects and engineers make mistakes and resources are finite and using them causes pollution and waste disposal problems—the very intensity of the earlier blind trust intensified the disillusionment and the reaction against it.

When science turned out not to be an infallible source of easy answers, quick fixes, and ultimate solutions to all problems, people sought them elsewhere. They turned to new priests, whether literally or more broadly in various cults or pseudo-sciences.

The key question—which seems to me to have been glossed over by most of those who explain the resurgence of astrology and creationism in terms of a loss of faith in science—is this: What

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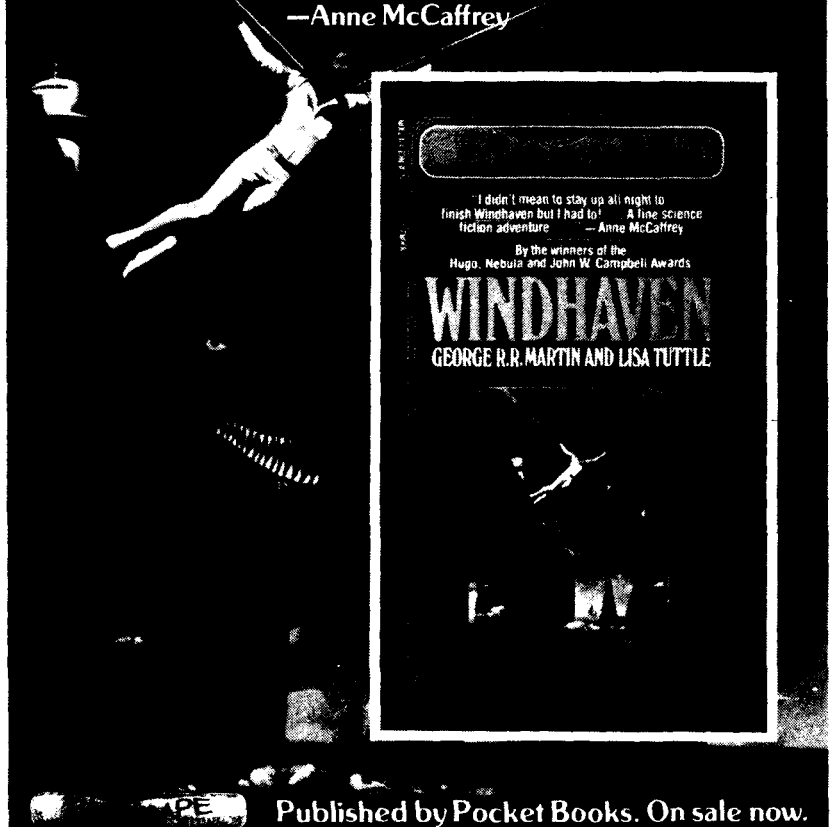
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kind of faith was it that was lost?

And the answer, I think, is that it was essentially the same kind of faith that gets placed in astrology or tea leaves or a literal interpretation of Genesis. *Most of the public has never viewed science as science*—because most of the public has never had more than the foggiest notion of what science really is.

All through history, human beings have looked for sources of handy, ready-to-go, infallible answers to all the problems of existence—everything from "Where did the universe come from?" to "Should I carry an umbrella?" or "Which horse should I bet on?" They have found these sources in Delphic oracles, chicken entrails, holy books, and horoscopes. No matter that the advisors couldn't prove that their methods were infallible; the customers weren't statisticians anyway, but they *did* have a deeply felt desire to have their decisions made for them. *Anything* but *thinking!* So they flocked to self-styled prophets and advisors wherever they could find them, and clung to each one as long as they could convince themselves that he was the best available. If he made too many really obvious mistakes, and a competitor came along with an alternative, they switched and tried the newcomer for a while.

Science, from the viewpoint of much of the lay public, is simply the newest in this history-long parade of objects of blind faith. It has been tried and found wanting, *not as science, but as a new superstition*.

And having shown smudges of clay about its feet, it has lost some of its competitive strength in that field. So its worshippers turn once more to *other* superstitions, conspicuously including very old ones whose failings have had time to fade in memory.

(Please turn to page 53.)

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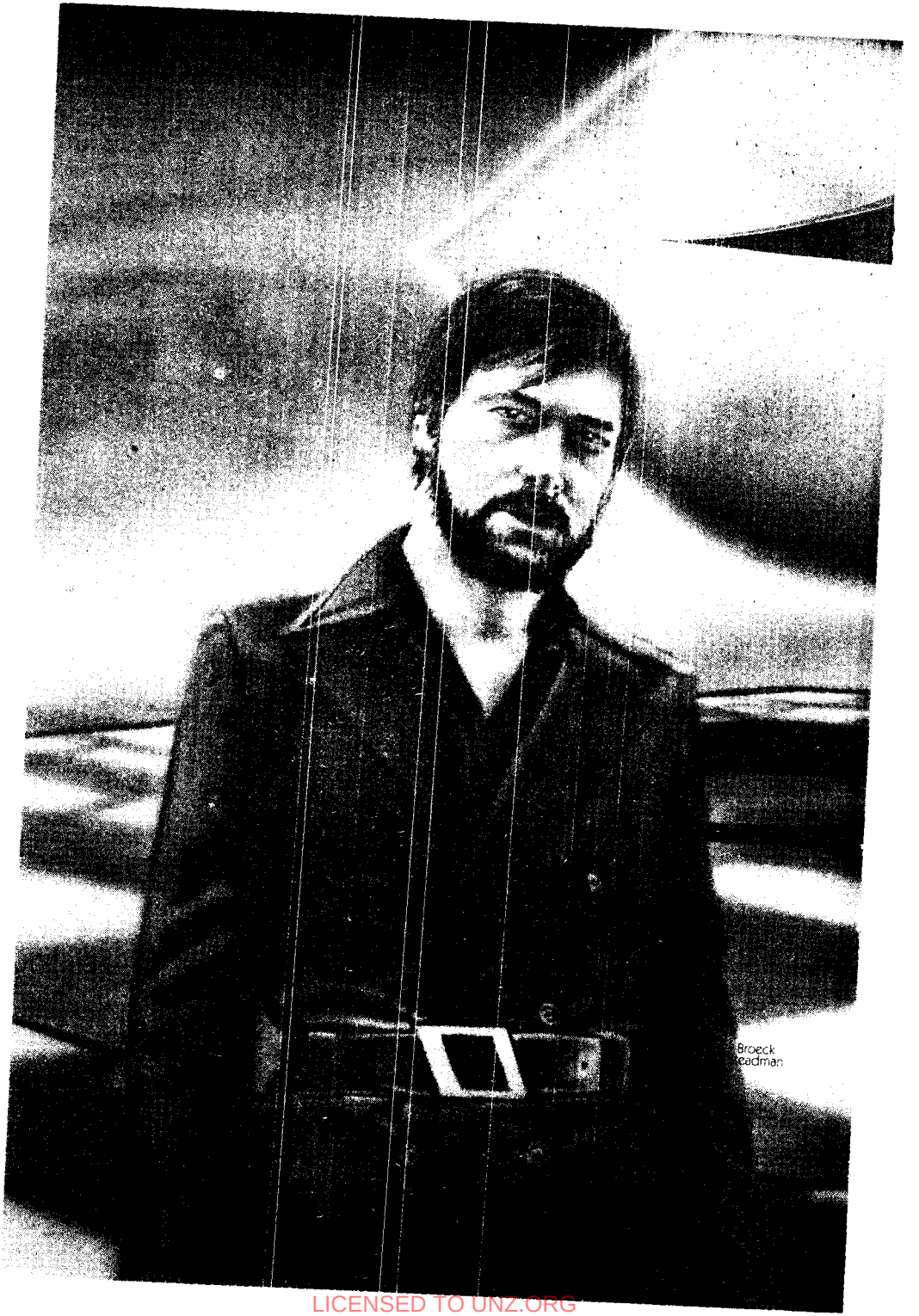

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Veddin's eyes closed as his warship skipped into normal space. His concentration focussed on his ship's sensors. Images poured through the shiplink embedded in his cerebellum. He had expected to find yet another Squishy ambush, but he floated safe and easy amidst his own robot fleet.

He opened his eyes, to see the beauty of normal space himself. The hard points of starlight and the brilliant sun of the Hydra system blazed with cheer.

Veddin's vision merged again with the images from the *DareDrop*'s sensors. The scene telescoped. The sun brightened, then dimmed as the *DareDrop*'s computer screened its rays. Soon Hydra floated just beyond Veddin's nose. It was a lustrous blue and white jewel, unlike anything in the FreeFed. His own home planet, Kaylanx, was perhaps more colorful with its violent swirls of red, green, and violet, but Kaylanx was not *warm*, as was Hydra.

He nudged his ship towards the planet. A small contingent of the main fleet followed. Senships scattered into early-warning array around the system.

This was foolish, Veddin realized — using standard military tactics just outside the one invincible planet in the galaxy. He almost ordered the senships back to the main fleet. But with a shrug he let them go. What else could he do with them, after all? For the first time, he understood why the Directorate had let him bring his fleet; now that FreeFed had been found by the larger human civilization, the Directorate had less use for the fleet than Veddin now had for the senships.

Something about Hydra disturbed Veddin. A troubled frown formed, then faded as he realized what was missing: There were neither moons nor battle-stations around the planet. His sensors backed off a bit and caught a single space station glinting in the sun. It was surrounded by gigantic freighters from the rest of human space. They were beautiful, and Veddin felt awed by the builders of these craft that dwarfed the *DareDrop*.

He also felt an unreasonable surge of joy, being here. It was different from anything he'd ever felt before, a joy that filled parts of his soul that until now had been empty.

Alerted by the sensation, almost alarmed, Veddin searched for an explanation. Meanwhile the joy grew stronger.

"Commander of the unidentified war fleet, this is maneuver control. Please identify yourself." The voice came not through any of the *DareDrop*'s communications channels, but through his mind itself. It reminded him of his first contact with a Hydran Couple, as the savage Battle of Kaylanx Moons climaxed. That had been just before the Hydrans drove the Squishy fleet terror-stricken back into their own territory.

"This is Colonel Veddin Zhukpokrovsk, from the planet of Kaylanx, requesting permission to dock," Veddin thought for the controller.

The sternness of the controller's first thought dissolved. "Veddin Zhukpokrovsk! We've been worried about you!"

Veddin must have transmitted his bafflement, because the controller went on. "The Seekers told us to expect you several days ago. When you didn't show up on schedule, Tarn and Tara Westfall

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became concerned—and when Tarn gets concerned, *everybody* gets concerned!"

Veddin was still baffled. He had come here to Touch Autumn Westfall, but

"Tarn is her father, you ninny. Tarn and Tara are the Commissioners of Hydra."

"They're what!?"

"Didn't anybody tell you that you have a psi-resonant pair bond to the Commissioners' daughter?" The controller chuckled. "Probably not. The Seekers wouldn't consider it a proper thing to mention."

Veddin was still dazed; the controller's thought pattern changed, and changed subjects as well. "Dear Colonel, why'd you bring a fleet with you? You certainly don't need it, and I suspect there's a rule against it somewhere."

Veddin was still trying to understand why the speaker's "voice" had changed. There were two chuckles this time, one in each "voice." "We're a Couple, silly," they said in unison.

Veddin shook his head; of course there were two of them, forming a single psi-resonance.

"Are you going to answer our question, or are you going to try to blast us out of space?" the controllers jested.

He tried to remember their question, and answered just as they were about to repeat it. "I brought my fleet in case I was ambushed."

Loud giggles threaded through his mind. Veddin felt aggravated anger. "Thank the Lords I did, too. I would've been killed if it hadn't been for my robots."

"What?" The laughter stopped; Veddin thought he could sense a trace of horror mixed with their shock.

He waited till the shock wore off, then told them about the ambush that occurred shortly after he left Kaylanx. Disbelief colored the controllers' thoughts so much that Veddin finally linked them with the *DareDrop*, so they could see and feel the giant hole gouged in her side by an enemy missile. If the warhead hadn't been a dud . . . well, Veddin never would have known about it.

When he finished, the controllers were grim. "We'll have to tell the Commissioners. I've never heard of an attack on humans from a species that knew about us."

The Couple vanished from his mind. The unexplained joy he had felt earlier returned, even stronger now than before.

Another Couple Touched his mind. "Veddin?"

"That's me," Veddin acknowledged, still contemplating the joy.

The new Couple saw his contemplation and shared his joy. "You're getting closer to your touched-one. Autumn feels the same thing." An image of a young woman appeared in his mind, sent by Tarn and Tara Westfall—for the Westfalls were the Couple who now contacted him. Another mind touched his, and he could see through Autumn's eyes a pair of delicate woman's hands, and he could look out the cockpit of a hoverplane at the oceans below. He knew that Autumn could see the *DareDrop*'s control room in much the same manner, through the link her parents provided.

"I am coming," was the message

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Autumn and Veddin exchanged before the contact dissolved.

"It will be better, of course, when you touch one another," the Westfalls explained to him. "For now, however, you'd better concentrate on docking. Or can your ship enter the atmosphere?"

"I can land anywhere," Veddin replied.

"Excellent. I'll put you in touch with spaceport control."

"Isn't there some kind of Customs inspection?"

"Ah, yes. Customs. Are you carrying anything dangerous—firearms, drugs, or potentially diseased foods, animals, or plants?"

"Nothing except a few gigaton-equivalents in weaponry."

"Are there safety devices to prevent misfiring?"

"Yes."

"Are you planning to use these weapons against us?"

"No."

"That's what the folks at the space station thought. Customs inspection ended."

"What?"

"Customs is much easier when you can just see what's in a person's mind. One thing, though." The thought was wryly amused.

"What's that?"

"Leave your war robots in orbit. There's really no need to land them."

"Sure." Veddin blushed an apology, but the Westfalls were already gone.

The landing was unlike any other. In the FreeFed, all ship-to-shore communication was handled via the ship's communication channels. Here, there were all the normal communication and detection electroptics, but in addition there was a mental link with the ground controller. Veddin found himself acting as a passive relay between the ship and the port.

At least he wasn't alone in being upset by the arrangement; the port controller had never dealt with a pilot who was in direct mental communication with his ship, either. "All in all, I'm glad it's over," the controller admitted to Veddin as the ship touched down. "It's takes a bit to adjust to that kind of arrangement." His thoughts turned sympathetic. "I fear that for *you*, though, the adjusting is just about to begin."

Veddin grimaced. The Seekers, when they first told him that he was half of a Couple, warned him that Hydra was different from Kaylanx. "Less sex, more laughter," was their capsule description. It had been funny, at the time: the Seekers had been so *grave*, while discussing sex and laughter, of all things! Here, their warning took on new meaning. Veddin had had trouble just finding a traffic controller who didn't giggle incessantly. The Seekers' warning had been true, despite its irony.

And there would be other problems, Veddin realized as he looked outside at the damaged hovacar coming to meet him. Veddin knew it was damaged, because there was just an open cockpit where the sealed capsule should have been. With an effort, Veddin accepted that the hovacar was not damaged at all. Lords of Tarantell! The people on board wore no spacesuits, nor even breathing masks! They were *outside*, on the surface of a *planet*, without any protection whatever! It made Veddin very queasy

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indeed. He tried to think of the phenomenon in a different way: Here was a planet where, instead of sealing small cities, they'd simply sealed the whole planet from outside disturbances.

He still felt queasy. Well, the people were wearing more clothing than people normally wore around Kaylanx; perhaps Veddin could think of the full-length pants, shirts, and boots as a sort of very light spacesuit. A *very* light spacesuit.

He pulled on the clothes the Seekers had given him on Kaylanx. They were a bit small—even the Seekers had been unprepared for a 230-centimeter-tall ex-wrestler—but Veddin was thankful for them. He would have felt terribly exposed standing outside on a planet with only a pair of shorts, sandals, and a utility harness.

At last he stepped out of the airlock. As Veddin came down the ship ramp, he recognized one of the three Couples waiting for him: Tarn and Tara Westfall. Each Couple stood hand in hand, fingers lightly interlaced. Meanwhile, the song of joy in Veddin's soul—Autumn's song, he realized—grew stronger.

Veddin stumbled as the world ended.

At least, it seemed like the world ended. Autumn's song just . . . stopped. For a moment Veddin was too stunned by his own loss to notice events around him.

One of the Couples screamed. Another Couple dropped to the ground, and the third Couple grabbed each other desperately.

A supply truck nearing his ship veered, coughed across the white armalloy skirt of the spaceport and crashed into a derrick. Thick smoke billowed around it.

Veddin regained partial awareness. The lost song was still his most immediate reality. When he saw the truck burning he gasped, "Autumn!" She must be in the wreckage.

Now fully aware, he ran for the truck. It was hopeless, he thought; Autumn must have died, or he would still feel *something*. Nevertheless he ran, and pulled at the crushed door. It came off easily in his hands.

There was another Couple in the truck. They seemed unhurt, yet they clawed at each other and wept, oblivious to the danger around them. "Autumn!" Veddin cried, peering through the smoke. She wasn't there. New fire belched from the truck's belly. He turned back to the hysterical Couple. "Get out!" Veddin screamed. "You'll be killed!"

They didn't respond. There wasn't time to coax. Veddin grabbed the man and hurled him from the wreckage. He took the woman's arm and dragged her away from the flames. The truck exploded. The Couple was still too close to the flames, but they seemed vaguely aware now, and they struggled away from the disaster.

Veddin wiped his brow. Where was Autumn? His eyes bulged as he saw a hoverplane slide over the horizon, canting to one side. Autumn's hoverplane! Still breathing hard, he ran for his ship.

His shiplink hadn't been affected by whatever calamity had struck the Couples; the *DareDrop* responded calmly to his commands. "Lock onto that plane," his urgent thought rang out. Through his ship's sensors, he watched the craft come down at a crazy angle toward the port. "Tractors on—hold the plane off the ground"—but as he gave the order his ship's computer told him

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the plane was too far away, and the angle was wrong. Veddin cursed; he'd have to launch to catch her.

But Autumn's parents were right next to his ship; they'd be crisped if the *DareDrop* took off now. He turned away from the airlock. One half of his mind watched the plane through his ship's eyes, one half sorted out the pathetic humans there by the landing struts. Pair by pair he dragged them onto their hovacar.

He cõaxed Tarn Westfall into pressing the accelerator. As the hovacar rocked away, Veddin rushed back to his ship.

Only the fact that the hoverplane started high in the sky had spared it from crashing; its rate of descent had increased dramatically. The plane was slowing down now, but it wasn't slowing down fast enough.

Veddin fell into his chair as the boosters blazed. He still shook with exertion, but he had to get into the air *now*.

The *DareDrop* lurched into position. As the tractors locked on, the plane actually fought against their guidance; but despite the plane's most furious counterthrusts Veddin landed it with a feather touch. He landed close by and jumped out.

Autumn leaped lightly from the plane. She looked awfully young in person. But, Lords of Tarantell, she was beautiful! Her deep blue one-piece jumpsuit held flickering threads of silver that outlined her long, supple body; the ocean wind whipped through her strawberry blonde hair, to set it shimmering in the sunlight. Her golden eyes blazed with angry fire.

Veddin paused as he realized she was angry.

"What the hell do you think you're doing?" she yelled at him. She had a thick accent, a more distorted form of Standard than even the language of Kaylanx. She stamped her foot. "I have to get to the space port. I don't have time for idiots."

"I'm sorry," Veddin muttered, blushing. With a start, he realized how unjust her attack on him was. "Wait a minute. Your plane was about to crash. I just saved your life."

She stared at him. "Man, what planet're you from? Haven't you ever ridden a plane before? That's the way they always fly. Computer controlled. Multiple redundancy. Nothing can go wrong." She muttered something under her breath.

This time Veddin turned bright red. "I'm sorry. It's just that, I'm from Kaylanx, and I've never—"

"You're from *where?*" Autumn had started to turn away, but now she turned back. "Veddin!" Her voice softened; indeed, Veddin wouldn't have guessed it was the same person speaking. "Are you, are you Veddin Zhukpokrovsk?"

Veddin nodded. "Yes, I'm, uh . . ." He was lost in her eyes. She approached him slowly, held out her hand, and his hand was there. When they touched, Veddin could feel a hint of that earlier joy.

Now Autumn blushed. "I'm sorry. When the feeling . . . stopped, I just *had* to get to the port as soon as possible, to find out what happened."

Veddin nodded. "Yes." He frowned. "I think there's something terribly wrong here. Your parents are, uh . . ."

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"What? What about them?"

Veddin's voice caught on the words. "I'll show you." He took her into the ship and they hopped across the last kilometer to the port, with the hoverplane in tow. As they flew, Veddin considered the mistake he'd made. "I guess I was nasty to assume your plane was falling out of control, but I thought it was manually operated, like the supply truck that crashed on its way out to my ship." He frowned. "Why are the planes automated and not the supply trucks?"

He realized it was a dumb question; how would Autumn know about spaceport supply trucks?

But she looked around the tiny compartment of his control room, and Veddin could almost see her picturing the outside of his vessel: a tight little gray teardrop, battered and scarred from too many encounters with too many enemies. She answered, somehow sad. "I've never seen a ship like this before. Probably the automated trucks wouldn't know what to do with it. They keep a couple of manual loaders just for unusual ships."

They arrived at the spaceport. Veddin landed a safe distance from the Couples and led Autumn into the open. He had been watching the Couples through his ship's sensors, but when Autumn saw her parents, she gasped and ran to them. "Mom! Dad! what's wrong?"

All three of the Couples had stripped of clothing. They clung to each other in grim caricatures of love's embrace. But there was no love there, only desperation, heat, and horror. Autumn tried to help cover the three pairs with the discarded clothes, failed, gave up.

She swung toward Veddin. "Don't stand there *staring*," she said, "we have to cover them up or something."

Veddin knew this wasn't a funny situation, but for just a moment he was taken by the absurdity of it all. He gave an explosive laugh, shook his head. "I'm sorry, my dear, but they pulled their clothes off of their own volition. It hardly seems like my responsibility to clothe them." A new expression spread over Autumn's face; he wasn't sure what it was, but he knew he wouldn't like the results. He continued hastily, "Actually, I think I may have some blankets on board my ship; I know I have some tarps, anyway." He led the way back into the ship. There was a narrow vertical tube just outside the control room, in the thick part of the teardrop. He knelt there and pointed down the ladder rungs. "There are towels and such in the bathroom, on that side."

She peered over his shoulder. "OK, I'll see what I can find. What else do you have?"

He rose and unlatched a compartment above them, which crashed with a resounding ring against the rear bulkhead. "Sorry," he muttered, "I usually don't do this in gravity."

Autumn hung on to him, rather shaken. "Yeah, I'll bet."

"Anyway, the tarps are up there, if you can find 'em."

"Okay. Can you give me a boost?"

"Sure." He lifted her up into the compartment. "Meanwhile, I have work to do." He retreated into the control

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room before Autumn's wrath could catch him.

"Where are you going?" she screamed through the walls at him.

"I'm gonna try to raise somebody on the radio," he yelled back.

"Who?"

"Just anyone at all on this peculiar planet of yours."

"Oh." Something clattered overhead, but Veddin forced himself to disregard it and work with the ship's various receivers and transmitters. First he tried contacting the port control tower, using the frequencies they'd used to guide him in. All he could get was muffled whimperings in the background. A thump outside announced the return of Autumn from the overhead compartment.

"What does anyone at all say?" she asked.

Veddin shook his head.

"Oh." She disappeared again.

Veddin was lost in his efforts for some time thereafter, growing more grim as each effort produced fewer results. At last he yelled, "I can't find anything!"

There was a gentle tap on his shoulder. "You don't have to yell," was the dry rejoinder.

He looked up; her nose was within inches of his. He was astonished at how beautiful Autumn's eyes were. He swallowed hard. "Did you get your parents all bundled up?"

"Yeah. They're, uh, all right I guess." She shook her head. "Faresh and Hella are almost catatonic, but at least they're still breathing."

"Um." Veddin shook his head, returning to the communication problem. "I get lots of inter-robot traffic, but there don't seem to be any people out there, sending or receiving anything."

"I'm not surprised—even if this is just a local problem, you're not likely to find *people* talking by radio."

Veddin stared at her. "Why not?"

She pursed her lips. "They're all psychic, you numbskull. What do they need radios for? Some of the more powerful transmitting couples run a sort of broadcasting system for news of general interest. There are some Couples that can't find a resonant psiband in common with some other Couples, but it's easy enough to get an intermediary if you've really got something to say."

"I see." Veddin bit his lip; he wished she'd told him that earlier. Well, she was concerned with her parents.

"Can we bring them on board?"

"Who?"

"My parents and the others. Can we bring them on board?"

Veddin opened his mouth, shut it. "Sure, we can stuff 'em in the empty supply holds."

Autumn's voice took on a dangerous edge. "It's either that or carry them to the control tower. The ship's closer."

Veddin felt his neck muscles tense. "Don't you think we should find out what else is happening around here? At least your parents are safe. Others may not be."

She gritted her teeth, then the defiance disappeared. "You're right, of course."

Veddin nodded solemnly. "We all have our moments."

Autumn harrumphed. "Only a moment, now and then."

Veddin rose from his chair, ducked

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out of the control room. "Where's the nearest town?"

As they stepped out of the airlock, Autumn pointed south. "I remember seeing a cluster of buildings that way as I was coming in."

"OK. The next question is, how should we get there: your plane or my ship? If you don't mind, I think we should take your plane. I doubt they'd appreciate me obliterating a couple of buildings with backwash."

Autumn put her hands on her hips. "Of *course* we're taking my plane. You think I'd trust *your* driving?"

They were standing next to the plane's door before Veddin realized that, for a long time, the two of them had been holding hands.

As the plane took off, Veddin turned to Autumn. She was turned away from him, and her shoulders were shaking. He touched her. "It'll be all right. All we have to do is find out what's causing this, and we'll fix it."

She turned forward. "I just don't understand why it's *destroyed* everybody. As nearly as I can tell, they're all all right except that they've lost their Touch."

Veddin nodded. "What penalties are involved in becoming a Couple?"

"What do you mean?"

"Do you lose anything in exchange for the wholeness of finding your touched one?"

She shook her head violently. "Of course not."

Veddin decided not to pursue it, but Autumn continued. "They've just lost their loved ones, that's all, in a way we can't even understand."

"Not even the loss of your loved ones should destroy your ability to act."

"Well, maybe it shouldn't, but it does. It would probably happen to you too if you lost your family."

Veddin looked away. "No, it wouldn't."

"How do you know?"

"Because my younger sister was on Moon Leiea when the Squishies destroyed it." He tried to swallow but could not. "Leiea was in my defense sector. When Laurain died, I knew." His voice took a note of determination. "But I couldn't stop fighting because of that. There were other moons, and Kaylanx itself. They would have destroyed the whole system, just the way they destroyed Colander, if we stopped fighting."

Autumn seemed slightly chastised. "I'm sorry."

"So am I." His hands roamed over the deep tears in the arms of his chair, the internal scars that matched the scars on the *DareDrop*'s hull. "I'm just glad the Hydrans felt the disturbance in the psifields and found us. Without you, we would have lost everything."

Her shoulders sagged, and for a moment she did not look adolescent. "Why do they all *hate* us so much? I can see why normal species think we're deformed mutants, with our occasional super-resonant Couple, and our billions of people with no psi resonance at all, but why can't they just leave us be? Isn't the terrible isolation we suffer punishment enough?"

Veddin watched the planet slip underneath. A cluster of unnatural shapes approached. "Look," he said.

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She peered over his shoulder. "It's the city."

Veddin never would have recognized it as a city. On Kaylanx, a city was a tight crush of warrens. Here the buildings were only one or two stories, and they were scattered across a grassy plain, completely exposed to the elements. To the northwest there were three stadium-sized buildings, and when Veddin scrutinized them he could make out the shapes of robots scurrying about.

Autumn saw the direction of his gaze. "Those are factories," she explained. "Mostly run by robots, though they're supervised by us. These factories make spaceship parts; the tallest roof encloses a final assembly area for small ships." As she described Hydra's shipbuilding industry, Veddin was again amazed by Autumn's technical expertise.

He made no comments.

She pointed back at the city proper. "Normally, you'd see Couples here and there sunning themselves." She bit her lip. "And there would be hovacars coming and going, and laughter—" She stopped on a sob. "It's happened here too."

Veddin reached over to hold her by the shoulders, then gasped. "Look!" He pointed at a Couple near the edge of town, directing a motley collection of robots to cart another Couple indoors. Even as Veddin watched, the Couple stopped supervising the robots. They reached out to hold each other tightly for a moment, then returned to their work.

Autumn redirected the ship's computer to steer them toward the Couple. "Thank the Lords there's someone left!"

The Couple on the ground was equally glad to see Veddin and Autumn step out of the hoverplane under their own power. The dark-skinned, dark-haired man clasped each of them by the hand. "Shea and Fanth Ostrit," he introduced his wife and himself. "I thought we were the only survivors," he said. "We need all the help we can get."

Veddin nodded. "What are you doing?"

"Getting people inside before they blister in the sun, trying to get them to eat." He shook his head. "Not much success with the second. We fixed up the first Couples with intravenous feeders and robot attendants, but we ran out of equipment." Even as he spoke he reached for his touched-one, who reached for him as well. The conversation ended while the two revitalized each other.

A baby cried on the second floor of the building to their right. Shea and Fanth broke out of their trance at the sound. "I'll go see if there's anything wrong," Shea said. She trotted into the house.

Veddin asked Fanth, "What *is* it that's happened to everybody?"

Fanth shrugged. "Somebody's jamming all our resonances."

"Fanth!" Shea came to the balcony of the house, cradling a child in her arms. "Hurry up here. The mother is turning blue. I don't know what's wrong with her."

"Right." Fanth dashed toward the house. He turned before entering and waved at one of the robots. "Peter! Follow me."

Veddin came up behind Peter, and Autumn followed him. "Why aren't

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you and Shea affected?'' Veddin asked as they climbed the steps.

We are. But I guess we're getting along better than most because we're sort of new here. The Seekers just brought us together about a year ago, and we haven't developed as close a bond as the others.'' He looked puzzled. ''Don't you feel the jamming? Are you multiply resonant psimates, who're strong enough to overcome it? You don't seem to be affected at all.''

They reached the second-floor landing, the door to one bedroom hung open. ''No, we're not multiply resonant,'' Veddin said. He felt a warning tug on his arm from Autumn, but he disregarded it. ''We're isolates.''

Fanth took a reflexive step away. ''Oh.''

Autumn stepped around Peter. ''That's not quite true. We *are* a Couple, but the Seekers just found Veddin recently. I was going to meet him at the spaceport when, when,'' she started to lose control, and Veddin held her tight.

Veddin finished explaining. ''Her parents were at the port. They weren't in very good shape.''

Shea poked her head out from the bedroom. ''Fanth?''

Fanth went in, took one look at the woman on the bed, and swore. ''Ciquestan's deficiency. Peter! Tell Chipper to bring my medkit!'' Fanth smiled wryly at Veddin and Autumn as they walked in. ''I was a doctor on Eridani III, before the Seekers found me. I never thought I'd use my training again.''

Autumn knelt by the bed. The woman was young, hardly older than Autumn herself, and almost as beautiful. Autumn spoke. ''What can we do to help?''

Fanth looked grim. ''Not much here, I'm afraid. You could start down the street where we left off, to see if there are others like this.''

Veddin looked out over the balcony at the horizon. ''What about the other towns? Are you sure the jamming is just here, on the spaceport island?''

Chipper whirred into the room. Fanth grabbed the bag and started to work.

Shea turned to Veddin. ''How would *we* know how widespread the problem is?''

Fanth looked up from inserting a tube in the woman's arm. ''It's probably the whole planet, Shea.'' His voice held little hope. ''A psi-resonant field keeps its strength no matter how far away you go. The jamming has surely spread all over Hydra.''

For a long moment the four of them pondered the scope of the disaster. At length, Fanth stood up. ''Well, we won't do any of them any good standing here. Let's go.''

Veddin shook his head. ''What are you going to do?''

Shea looked tired. ''We'll go on down the street. What else *can* we do?''

Autumn stomped her foot. ''You can't help the whole planet like that!''

Fanth started shaking with stress. ''We can't do anything about the whole planet. We have to do what we can. Maybe there are other Couples like us and—'' he paused, ''couples like you, who can help the people on the other islands.''

Autumn leaned forward to say something cutting, but Veddin spoke first.

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"What happened to this woman, anyway? Is this a reaction to the jamming?"

"In a sense. She has Ciquestan's deficiency, which has nothing to do with the jamming, but she and her touched one probably kept the chemical imbalance under control using their psi powers." Fanth paused.

In the midst of the stillness, the sound of someone's breathing stopped.

Fanth turned back to the bed. "No!" He ripped at the sleeve of the woman's gown, and pushed another needle in. A mottle of darker blue spread across her features. "Damn!" Fanth clenched and unclenched his hands, not knowing what to do.

Shea took him by the arm. "Come on," she whispered. "We'll save the next one." She looked at Autumn. "We'll be down the street if you need us." They shuffled out of the room.

Veddin turned away from the dead woman. "We have to find the jammer." He didn't know what to do in this house. He hurried to leave. "Isn't there some way to track down the source of a psi field?"

Autumn didn't answer till they were out of the house again. "Some of the most sensitive receptor Couples, and the telekinetics, can home in on a sender's location in space. But . . ."

"But all the receptor Couples and telekinetics are probably in bad shape, and even if they aren't, if they tried to find the jammer they'd probably get broken up and then they'd *really* be in rough shape," Veddin completed her sentence.

She looked down. "Probably."

"Isn't there some mechanical way to locate them? On Kaylanx, we developed the ability to at least detect resonant psi fields, after we met the Squishies. We were even able to shield ourselves somewhat by the time they attacked Kaylanx. Surely Hydra has a far better psi technology than the FreeFed."

"Not really. There's never been a need to understand psi here; all they've ever had to do is use it." Autumn looked up at him. "There have been some experiments, at a couple of the universities. In fact, I seem to remember hearing about Couple Berrens, on Pyrta, making some breakthroughs recently." Her voice perked up. "The Berrenses have an especially powerful resonance, too; they might've been strong enough to survive the jammer, especially since Pyrta is on the other side of the planet." Autumn's features tensed with hatred. "When we find out who's responsible, we'll kill them."

"First we have to find them. How can we contact the Berrens Couple?"

Until that moment, Veddin hadn't noticed that the sun was sinking. The city lights had been slowly brightening, taking up the slack. Now Veddin noticed the lights, because they went out.

Earlier, the city had been too quiet. Now the stillness was deathly.

Autumn's hand came to her mouth. "Oh no."

"What happened now?" Veddin tried to force himself to grasp the kaleidoscope of disasters the last few hours had brought. He didn't succeed.

"The fusion reactor for this island chain must've failed. The reactors are monitored by psikinetics, who tune the reactors by controlling the cold catalyston flux. The flux density must've dropped below the critical region. There's

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no power, probably anywhere in this whole ocean."

Veddin rolled his eyes. "Joy. Don't you people do anything without using psi powers?"

Autumn's eyes were flashing again. Veddin decided that that was their natural state. "Of course we do things without psi! Why do you think we have fusion reactors in the first place? For the most part the machines do the work. Couples only do the important work, like keeping the machines from going berserk." She paused. "People only do a handful of the most important jobs. It's just that the important jobs are, uh . . ."

"Important." Veddin said dryly. "So now it's only the important jobs that aren't getting done." Looking around, he saw a robot frozen in the middle of the grassy lane; undoubtedly it was externally powered, by transmission lines from the reactor. "It looks like none of the unimportant work is going to get done around here anymore, either." He pointed at the robot.

"It could be worse, you know. If the flux had gone up instead of down, the reactor could have exploded."

It was Veddin who exploded. "Surely you've got failsafe systems!"

"Well, we do, but . . ."

"Lords of Tarantell! Even your hoverplane had multiple redundancy!"

"Yes, you're right, of course. But hoverplanes are usually flown by people who'd be helpless if the plane failed. The reactors are run by psikinetics who specialize in probability manipulation." She paused. "We import our reactors, and the reactors come equipped to be operated by isolates. But since there's *always* at least one psicouple, probably two, watching a reactor, I'm afraid we don't maintain the systems the way we ought to. I've mentioned it to my father a couple of times, but I don't think he ever did anything about it."

Veddin wanted to scream. "We've got to fly back to my ship right away. I'll pull in some of my senships from system orbit, put them around the planet. At least then we'll have warning if one of Hydra's reactors blows up." He headed for the hoverplane.

Autumn pulled on his arm. "Wait, Veddin. We can't fly back." There was a hysterical note in her voice.

He turned toward her, jerking quickly; his nerves were also frayed. "Why not?"

"The plane—it's beam-powered. It won't fly."

Veddin was stupefied for only a moment. "Then we walk." He turned back to the grassy lane, turned left, turned right, threw his hands up. "Which way do we go?"

Autumn bit her lip. "I don't know."

"Wonderful. Do you have any maps on your hoverplane?"

She shook her head. "We don't use maps here."

Veddin just stared at her, the question on his face.

She answered. "When a Couple wants to know how to get someplace, they just think with another Couple in the right area, someone who knows their way around that island."

"I see." Veddin felt weak. "And you, milady, how do you navigate?"

"Sometimes I have friends put me in contact with the right Couple." She

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shrugged. "Actually, I usually ask the robots how to get where I'm going."

Veddin stared at the frozen robot in front of him. It stared back. Finally Veddin burst out laughing; it seemed a more reasonable reaction than crying. "Do they shoot looters here? I'd guess not. Come on, lady." He held out his hand. "We'd better eat something before we leave. It could be a long journey."

Together, they headed into the nearest house.

While Autumn rattled through the kitchen, Veddin stepped outside and looked for a convenient roof to climb. Seeing none, he loped to the tree behind the house, and sped to the top: it was a lot different to climb a live tree than a jungle gym, he discovered, but not enough to stop him. Peering around in the fading light, he spotted what looked like a starship's needle prow. It was more or less back in the direction he thought they'd come from. Satisfied, he returned to Autumn.

Through the door into the living room Veddin could see two pairs of eyes staring at him. The room was gloomy, but Veddin thought the eyes belonged to two children. He felt certain that they were holding hands. "Hi," he waved at the kids, and stepped toward them.

They vanished before he could reach the doorway.

"There's no need to be frightened," Veddin shouted out. "Are you hungry? We're fixing things to eat." He became aware of scuffling behind him and turned to Autumn.

"It's no use," she said, "they don't speak Standard yet."

"They don't? They look like they're nine or ten. Surely they've learned the language by now."

Autumn shook her head as she searched the cabinets. "It's the last thing they teach in the schools." She smiled at him. "You keep forgetting that this is Hydra. Those children are touched-ones, with the same telepathic powers everybody else has."

"Don't they learn a little before they come here?"

"Those two you just saw were born on Hydra."

"Really? That's some coincidence, isn't it, for both members of a Couple to be born on the same planet?"

"Not on Hydra." Autumn snapped down a knife on a wedge of cheese. "Couples don't necessarily fall in love, get married, and have children, you know. Sometimes they even hate each other. Many of them have other lovers. When someone wants to have a child, the Seekers try to find matings that will produce children with resonant bonds."

"I didn't know they knew enough about Coupling to do that."

Autumn snicked some sort of taff roll in half with a loud bang. "They don't. They make a lot of mistakes."

Veddin came up behind her and wrapped his arms around her waist. "I'm very thankful for one of those mistakes."

He glimpsed a smile playing across Autumn's lips.

Veddin stepped away. "What's for dinner?"

Autumn turned to the table. "I'm sorry I couldn't do better," she said, waving her hand at a collection of pale vegetables. "But most of the food here

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requires cooking, and of course we don't have any power."

Quite all right," Veddin replied, taking a healthy bite out of a lime-colored but otherwise carrot-like thing. He made a face. "On second thought . . ."

Autumn looked away, and Veddin was mad at himself. "Wait. I didn't mean it. Here, eat something with me. We have to hurry. I think I know where we're going, but I'd rather get started while there's still some daylight." He went back to munching on the green carrot, and Autumn joined him. "In fact," he started stuffing his pockets with food. "I think we can probably carry this stuff with us."

"Stop!" Autumn ordered as he grabbed a plump blob. "You'll crush the ograns. I thought I saw a knapsack in the living room; we can find a better way to carry stuff than in your pockets."

"Fine." Veddin watched with both humor and joy as she gathered up the food: she was beautiful, and durable, and spoiled, and he feared he was quite in love.

Disregarding Veddin's offer of help, Autumn whipped the pack to her back. They headed off past the hoverplane, in the general direction of the starship prow Veddin had seen. "How old are you, Autumn?" Veddin asked.

"Almost nineteen. Why?"

"Just curious." Veddin was almost thirty himself.

"Were you hoping for a respectable old dowager? If so, that's tough. I like me as I am."

"I see. I guess I can live with that."

"Yeah!" She flashed him a smile with the same energy her eyes held when she was angry.

"Yeah." He considered her for a moment. "You know, all through this trip I've been surprised at how much you know about the machines here: the spaceport, the factories, and the fusion reactors."

She shrugged. "I talk to the robots a lot. And I've spent a lot of time working with equipment all over Hydra. Most of the Couples don't like machines. They'd probably get rid of them if they could. But not everybody is a multiply-resonant telekinetic/psikinetic /receptor/broadcaster. Most of them need the machines as much as people from Earth or Kaylanx." She hesitated. "Sometimes I think I have more in common with machines than with people. The robots don't have any touched-ones either." She smiled shyly at him. "At least, I *used* to think I was like the machines. Until you came."

They trudged silently along for a time. The neatly cut lawn of the city turned wild and ragged as the buildings disappeared in the distance. It started to get cooler, and darker; far darker than Veddin had ever seen it get on a planet. He moaned when he realized why. "Lords of Tarantell! You don't have any moons here!"

It took Autumn a moment to understand his meaning. "No, of course not. Hydra doesn't have any moons. Why?"

"Because we're trapped out here, that's why. In a few minutes it'll be too dark to see." He glanced back the way they'd come. "There's not a building close enough to get to, either."

Autumn laughed. "Don't worry, the

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wild animals won't hurt you. We don't have any wild animals."

"No, but we'll get damn cold, at this latitude." He considered it for a moment. "Though I was sort of surprised at how warm it was during the day."

Autumn laughed again. "Of course it's warm, silly. The psikinetics control the weather, taking the edge off the . . ." She stopped laughing. "Lords of Tarantell. No."

"Well, let's hope the loss of weather control doesn't catch up with us for a couple of days. I think we'll make it through tonight, and tomorrow we'll be back on the ship."

"Yes, but—" she shook her head. "The main purpose of the weather control is to stop the tornadoes and hurricanes that're constantly starting up around the equator. If we don't stop them, they'll destroy most of the islands. And all the people who live there." She paused. "Including Couple Berrens and the university."

Veddin picked up the pace.

And stopped when Autumn stumbled in the dark and cried out in pain.

"You all right?" he asked, kneeling next to her.

"Yes. I stepped into a rut, I guess." She reached down to touch her left ankle.

Veddin gently squeezed both her ankles; she seemed to be all right. "We're stopping here for the night."

"We can't."

"We are." They did. Veddin lay down beside Autumn, reached out to hold her.

She squirmed away. "I don't think we should, uh . . ."

Veddin rolled his eyes in disbelief. What had the Seekers *told* her about him? Did they think he was a sex maniac? "Child, I've had more than my share of women. I don't need to add you to the collection. But it's getting cold out here, and I'm damn well going to hold you warm until morning. Now, if you want to kick and thrash with a man who just plans to conserve your energy, that's fine by me, because it'll surely keep you warm enough. But you don't have to."

She snuggled up next to him. "OK."

She was a warm glow in his arms. Veddin chuckled. "On the other hand, if you want to be added to the collection, that'll keep you warm too, and—" Veddin swallowed hard as Autumn jabbed him in the stomach.

They eventually dozed into fitful slumber.

As he rolled away from the sunshine, he choked on a dew-laden clump of grass. With a moan, Veddin extricated himself from Autumn's death grip. He stretched.

It was a mistake. He was cold, damp, and very very stiff. His stomach was hungry. And his brain was dead tired.

He turned to his companion, shook her gently. "Hm?" she mumbled. Veddin pulled her to her feet, ran his hand through her hair in a futile attempt to remove the worst tangles. Still she was beautiful in the morning light.

"Leave me alone," she yawned.

Chuckling, Veddin shook her.

"Cretin. I've committed mass murder on a dozen planets for lesser offences," Autumn mumbled, her eyes closed. "It's unhealthy to get up when you're asleep."

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Arise, arise." Veddin told her as he slung her right arm over his shoulders and half guided, half carried her down the road. "Kill me later. At the moment we have a planet to save."

Her mumblings subsided. The sun rose, the people warmed, and soon Veddin could again see the spires of spacecraft in the distance. "Hail the miracle! We've been going in the right direction!"

"Great. When do we eat?"

"As soon as we arrive. As soon as we get within shiplink range of the *DareDrop*. I'll tell her to start cooking breakfast. I suppose there'll be enough food for two. Of course, the ship's awfully small, so you'll have to eat outside." Veddin wisely told her this from an adequate distance; when Autumn lunged at him, he dodged easily.

"You're an evil man," she told him, though it was her joy that flashed, not her anger.

As they came within broadcast range of Veddin's shiplink, Veddin told Autumn what news the ship had to offer. "Nothing's changed, Autumn. Your parents are still half way to the control tower, out of control."

"Have they eaten yet?"

"No."

"Let's get them aboard your ship and take them with us."

Veddin pursed his lips. "There isn't room."

"Well, it would be kinda crowded, yes."

"No. If we have to fight, they'd die without acceleration couches."

"What fighting?! Who could you possibly wind up fighting?"

He looked at her quizzically. "Don't you remember? You were going to kill the jammer."

"I was joking."

"You may think so now, but you were serious then. Think, lady. How did this happen? It's sure not a natural phenomenon. You said yourself that plenty of species hate us."

"Nobody'd dare attack us!"

"The Squishies dared to attack me, even though I was on my way here."

"What?!"

Veddin told her about the ambush. "This jamming would be a brilliant *coup de grace* for them. I'd swear this was their doing, if I knew how they could have done it." He shrugged. "I don't know how anybody else could have done it, either. I still bet it's the Squishies."

Autumn was silent.

The *DareDrop* was clearly visible now. "I'll race you to the ship," Veddin offered as he began trotting. Autumn passed him in a flurry of blonde hair, and he was surprised to find himself gasping for breath when he caught up with her. "Men are so weak," she sniffed as they climbed aboard.

As Veddin plunked down into his chair, he glanced up at Autumn. "I'll bet we don't know how to get to your research island, do we?"

Autumn groaned. "No, you're right."

"Um. Fortunately I have given this matter some thought. You say the machines here know how to get around?"

"Yes, but they all use transmitted power. They're all shut down."

Veddin laughed. "Not all. Just the ones in this island cluster, that are powered by the deactivated reactor. Which reminds me." He closed his eyes for a

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few seconds. "There. I've called some of my senships into planet orbit, to watch for exploding reactors. And I've sent a message shuttle back to Kaylanx, to tell them that the Couples of Hydra are out of commission, and they'd better get the warfleet back in shape before the Squishies show up." He closed his eyes again, to concentrate on the *DareDrop*. "Back to current events. What's the name of the island we're looking for?"

"Pyrta."

Veddin relaxed in his chair, working with his ship to communicate with Hydra's network of automatons. "Strap yourself in. We're gonna make this a short ride."

The blastoff was less than gentle. Veddin had pangs of sympathy for Autumn, listening to her gasp for breath, but he could no longer suppress the sense of urgency he'd felt since they were stranded in the city. Pyrta was near the equator; he could just see the two of them arriving in time to watch a hurricane smash whatever useful equipment there might be to bits.

Once in free fall, Veddin asked more questions about Hydrans. "Autumn, *why* are humans so different from other species? What makes human psis so much more powerful—and so much more rare?"

Autumn looked a bit wan from the acceleration and now the weightlessness, but she answered nevertheless. "There are a lot of arguments about that; it may be the hottest question the biologists have." She untangled her arms from the webbing, tried to get comfortable. "One part of the answer is pretty straightforward. As the . . . complexity, I guess, of an organism increases, the probability of resonant psi-bond formation decreases: There are so many more links required to form the resonance. The flip side of that, though, is once those linkages form, the resonance is much more powerful." Her expression turned perplexed. "What we don't really understand yet is how we could have evolved so far before developing psychic powers. Everywhere else, psi develops before intelligence does. Psychic ability usually serves as the bridge from muscle-oriented evolution to intelligence-oriented evolution. 'Course, the evolution of intelligence doesn't go too far. It always plateaus before the beings get too complex for near-one-hundred-percent pair formation. An average alien Couple isn't quite as smart as an average human in isolation."

Veddin nodded. "How related are complexity and intelligence? Are more intelligent Couples more powerful as well?"

"Not necessarily. Psi power and intelligence are related statistically, but not directly. My parents, for example, have a normal, single-resonance bond. But they're very intelligent, or they wouldn't be the Commissioners." She shook her head. "On the other hand, there are some really *dumb* Couples out there that are awfully powerful."

Veddin chuckled. "I see." He thought for a moment. "But you still haven't told me why Man developed so much intelligence without developing any psychic powers along the way."

"Nobody knows. We think early man must have had psychic abilities; marginal pre-men wouldn't stand a chance without it." She shrugged. "But then

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the psychic abilities disappeared, somehow. The pre-men had developed just enough so that continued evolution of intelligence worked better than reverting to animals."

Veddin closed his eyes as the *DareDrop* interrupted. "Get ready. We're going back down." Just before the acceleration hit, he wondered. "You know, maybe the same thing happened to those pre-men that's happening here."

"What?"

Wouldn't that explain it? Suppose somebody started jamming the psifields on Earth, way back when?"

Before Autumn could reply, the breath was squeezed from their bodies.

They stepped out of the *DareDrop* into a large circle of scorched earth. The stench from the crisped wildlife caused them both to gag.

"You practically destroyed the place we were coming to visit," Autumn complained. "Even our biggest ships don't wreck the landscape this way."

They hurried from the area. "The *DareDrop* is a warship, woman. It is not a sightseeing bus. You need power in a warship, not pretty baffling." They were out of the ring of destruction, and the air was laden with the smell of flowers of all kinds. Veddin sneezed, powerfully, and stifled a second attempt by his nose to protect itself.

"Are you all right?"

He straightened up, gritted his teeth. "Sure." He was allergic to flowers, but he'd survive. "I just hope the buildings are air conditioned."

The heart of the university was six six-story buildings hexagonally arranged. Veddin remained in contact with the *DareDrop* via a portable shiplink amplifier. And the *DareDrop*, in turn, stayed in contact with Hydra's automaton network. The ship told him which building contained the Berrens office; he led Autumn at a brisk pace through the doors.

There were two people in the outer hall, one clinging to the left wall, one to the right, dying. Autumn hugged herself closer to Veddin. "What can we do?" she whispered.

"Stop the jammer," Veddin replied, walking past them.

They stopped as they reached the center well of the building. "Great," Veddin muttered, "now what?" They looked around together. "Don't they have a directory or something on the wall, to tell you how to get to different offices?"

Autumn pointed at a booth with two chairs. "Usually, there's a receptionist who—"

"Who puts you in Touch with the people you're looking for. I should have guessed." Veddin snorted. "Why is nothing ever easy here?"

Just then, a Couple came to the rail on the second floor. "Who are you?" the man croaked. He had obviously not used language for years.

"We're looking for Couple Berrens," Veddin called out. He saw a staircase and, grabbing Autumn's hand, hurried for the second floor. "Don't go away, we'll be up in a second."

"Where is there worth going?" the woman said with cold amusement. "There is, of course, our office, which is at least comfortable. Follow us."

Cursing under his breath, Veddin reached the second floor just in time to watch the Couple disappear down a cor-

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ridor. He and Autumn caught up as they turned right through a glasscene door with the inscription *Couple Shayloh* above it.

Still holding hands, the Couple wrenched the curtains apart to let in some light. "Who are you? What did you come here for?" the man asked.

"I'm Autumn Westfall, and this is Veddin Zhukpokrovsk."

Veddin gave them a Kaylanxian salute.

"We're here to see Drs. Berrens, to see if they have any machines we can use to track down the jammer."

"Really," the woman said, with the same cold amusement she'd shown earlier. The Couple took a couch in one corner of the room; Autumn led Veddin to a couch across from them.

The woman continued. "I'm intrigued. Imagine using a *machine* to locate a source of psi power."

The man chuckled; at least, that's what Veddin took his gagging sound to mean. "Yes, my dear, a machine." He looked at Autumn. "Unfortunately, Drs. Berrens are dead. The shock of separation was too much for them."

Veddin had seen too much death to be shocked; he was more intrigued by the Shaylohs. "What about you two? Why haven't *you* died?"

"Because we are class 9 resonants," the woman began haughtily.

"Not even the most powerful jamming could possibly break our bond," the man ended.

"Can you locate the jammer for us?" Veddin demanded.

"No." The man wheezed. "We can't even transmit to you across the room." His wheeze turned into a sigh. "It hardly seems worth living."

The woman spoke again. "You're isolates, aren't you? That's why you're not affected."

Autumn blushed. "No, we're a Couple, but we had just met each other when the jamming started, so we really didn't get a chance to, well . . ."

"We haven't lost our souls, like everybody else on this planet," Veddin said in disgust.

The Couple stared at Veddin long and hard. "Don't mock us, isolate," the man said.

"You have no idea how great the gift of psi resonance is," the woman said.

Veddin started to lose control of his temper: "But I do know how great the price is, half-creature. Are you even now too blind to see how much you've lost?" Veddin shook his head. "No matter. Tell us, how do we find the Berrens laboratory?"

"I don't know how to explain in words," the man said in anger.

"Then lead us," Veddin demanded.

The man just glared at him. Suddenly Veddin was aware of the time ticking by, while people all over the planet drew closer to death in many hideous ways, and his patience disappeared. With two swift strides he was between the paired ones, and he wrenched them apart. "Tell us," he spat.

The man shrieked; the woman whimpered. "Please," they begged as one.

Autumn started to speak, but Veddin broke her off. "Tell me," he repeated.

"Hemten!" the man choked out. A wide slab of metal rolled around the corner. "Our research robot will show you," he explained.

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Still Veddin held the Couple apart while the robot whirred into the room, until they had explained to the robot what was wanted.

"Release them," Autumn begged.

"Of course," Veddin replied, doing so.

Huddled in each other's arms, the Shavlohs glared at Veddin. "On another day, we would have destroyed a barbaric creature who dared to keep us apart," the woman said.

Veddin turned to them with a hot reply, but he took a deep breath and willed himself to remember the warm welcome he'd received in approaching Hydra, and the gentle power of those who had come to Kaylanx to stop the war. "On another day," you would be a noble and generous Couple, and we would be friends."

As they followed the robot down the hall, Veddin noticed Autumn pondering him reflectively. "You were barbaric in there," she said, "but you were right. And at the end . . . You're not a barbarian." She held out her hand, and they moved together into the room through which the robot disappeared.

The walls were studded with readouts and mechanical arms; the central workbench was littered with parts and patching. Veddin saw movement out of the corner of his eye. He turned and gasped. "Squishies!" With a vicious tug he pulled Autumn behind him, and from the bench he grabbed the longest tool he could reach. "Get down!" he ordered Autumn, then leaped at the two purplish jelly-soft humanoids who stared at him with unreadable expressions.

"Wait!" Autumn screamed in his ear, then grabbed at his drawn-back arm. Veddin, surprised and off balance, tumbled to the floor. "They're not Dioreclans!" Autumn cried. "They're our friends!"

Veddin rolled catlike to his feet. He paused just long enough to see that indeed these were not quite like the Squishies he'd fought at Kaylanx. The noses were flatter, the arms longer, and the faces held flecks of green.

Autumn blocked his path. "It's all right. This is a Couple from Tarca. The Tarcans are on our side: though they think we're deformed mutants, they're more amazed than horrified. Hydra is crawling with Tarcan scientists who're studying us like crazy. We're the most interesting puzzle to come along in millennia."

As Autumn spoke, the aliens moved very slowly, their outside hands raised in weaponless greeting, their inner hands clasped together. When they were close, one hand reached out to Veddin. His muscles writhed in horror, but he let the alien touch him.

He came into direct mental contact with the Couple. Since they had also touched Autumn, he had indirect contact with her as well.

"Aha," the aliens thought. "Another powerful resonance broken asunder." The mind held a moment of puzzlement, then expressed understanding. "No—two isolates who would be Coupled, but not yet. Am I right?"

Autumn and Veddin agreed, as two separate voices. The two alien personalities were for all practical purposes just one being, but Veddin could tell Autumn's thoughts very distinctly.

Veddin's foremost thought was as-

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tonishment that this alien Couple was still able to transmit.

"Yes, though human pairings come apart, our bond is unharmed," the Couple continued, amused. "Obviously."

Again, Veddin and Autumn thought the same thought, though again they were distinct thoughts. "How can that be? Only the most multiply resonant of the human bonds have even a scrap of Coupling left."

Again the Tarcans were amused. "Yes, this seems quite a puzzle. Human Couples are so powerful, yet so . . . fragile. We believe the difference must be evolutionary. In our species, the bonds were tested for millions of years under harsh conditions: other species on our planet also had psi, and any Couplings that could be broken were, during that time."

Veddin saw an image of Autumn's parents, and Autumn thought at the aliens, "Can you find the source of the interference?"

"No," was the sad response. "But we see you came seeking machines to do such seeking. We have no direction-finding mechanisms, but we do have several units that can detect psifields and measure their local strength."

"What good will that do? If psifields don't lose strength with distance, how could we even tell if we were getting close?"

The aliens projected no thoughts for a moment. "It is true that psifields attenuate very slowly, but they do attenuate."

"We'll use my ship," Veddin realized. "Would interplanetary distances be enough to detect changes?"

The aliens assented.

"Then we should at least be able to tell whether the source is on Hydra or not."

"Yes." The Tarcans looked at an instrument on the bench; as Veddin saw it through their eyes they explained its operation to him. "It's strictly experimental, so treat it gently," they warned.

"Like a kitten," Veddin promised as he reached to pick up the gadget. He pointed at another piece of equipment. "That looks like another model of the same thing."

The Tarcans agreed. "But don't try to move it; that was the first one, and it's tuning is not adjustable. Even a tiny jar could break it."

"That's all right." Veddin turned his thoughts to Autumn. "I want you to stay here and use the old one. We need a detector permanently stationed to watch in case the jammer moves. Somehow, I suspect that when he sees my warship dropping on him, he may try to get away, or something silly like that."

Autumn raised her eyebrows. "No way. I'm going with you. These people can watch the detector."

Veddin snorted. "Great. How will I talk to them? I can talk to you via Hemten"—he nodded at the robot, now sitting quietly in the corner—"but not with the Tarcans. They don't even have vocal cords, do they?"

"They know how to read and write. They can communicate with the robot just fine—better than most of the native Hydrans," Autumn retorted.

Veddin shook his head. "Besides, things may get nasty after I find the jammer. I *still* think it's the Squishies.

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And whoever it is, he's bound to be armed to the teeth."

Even under normal circumstances Autumn's anger was hard to bear; but now, through the Tarcan linkage, Veddin could *feel* her anger in his mind. It was a palpable, relentless force. Veddin started to succumb when an alarm went off in his brain.

It took him a second to realize that the alarm was from the *DareDrop*, rather than from one of the people in mental linkage. "My Lords," was his last oath before breaking contact with the Tarcans.

With a bound he was at the door. "A Squishy fleet just skipped in," he explained rapidly, though Autumn had seen the images in his mind as well as he had. "They'll destroy the whole system if we don't stop them." He took a deep breath. "It's a big fleet." Numbers and descriptions were already pouring into his brain, and every second the prospects turned bleaker: the Squishies must have stripped their worlds raw to bring these fleets here. Lords, how Veddin hated fanatics! "I can't hold them for long. We have to find the jammer and destroy him, so your people can deal with the Squishies. I'll still take readings on the jammer's strength; I'll just do it while I'm shooting missiles and commanding a fleet." With that, he was running down the hall as fast as he could go. "Tell the robot to link to the *DareDrop*!" he shouted over his shoulder.

He was being crushed to death by the fury of his own acceleration when he got the first message from Autumn. "Veddin, my detector reads 7.9."

Veddin scowled at his own detector, sitting on his copilot couch. He remembered the Tarcans warning to treat it gently. "Gently," he muttered. He eased up on the acceleration enough to reach over and switch the thing on. "Mine reads 8.8," he radioed back to Autumn. "Obviously, our detectors aren't calibrated with each other. I guess it was silly to hope this would be easy." If his own detector was even still working correctly.

Once out of the atmosphere he started warming up his shields and beamers. The ships in his robot fleet did the same even as they sailed into position to meet the titanic swarm of enemy. For a moment he considered telling Autumn to peek out a window, to see the most incredible light show in the universe, then shrugged the idea aside. She probably wouldn't be impressed; or worse, she would be scared for his own safety in the hell that would soon evolve.

Veddin pulled a tight orbit around Hydra and headed for the fleets.

Autumn's voice came through again. "I'm sorry, Veddin. More news. Veddin, my reading has changed. It's dropped to 7.7. The jammer's moving."

Veddin didn't have the time to be upset; the battle had already been joined. The Squishies were blasting into the system at an acceleration much too great for them to stand for long. Fanaticism was at work again. Veddin's fleet was only partly gathered, and they were retreating as fast as they could, waiting for reinforcements.

Fortunately, the robot ships could maneuver rings around the Squishies; but if they couldn't slow the Squishies down soon, there wouldn't be room to

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fight before Hydra was overwhelmed. Veddin inched his acceleration up another notch, and started skipping in and out of normal space like a drunk star racer; he was too far away, the lag time for his communications was crippling his fleet.

And then he decelerated as viciously as he had accelerated: the Squishies had already launched a salvo of planetbreakers! Veddin's own ships were strewn too thinly to catch them all; he would have to get them himself. The Squishies must have had planetbreakers to waste, to start shooting them already. Well, they'd keep Veddin tied down by Hydra, anyway.

"My detector is still reading 8.8," he told Autumn. "I'm gonna veer off now and get a third reading from another direction." He didn't tell her that he was heading that way primarily to stop the Squishy missiles.

There was something funny about the missiles; some of them didn't generate the radiation trace of planetbreakers. One of the senships he'd left in orbit around Hydra scanned them quickly; they were full of electroptics, but there was no warhead. Damn! "Autumn, the Squishies are shooting some strange missiles. I'll bet they're full of psi-jamming equipment." If he were right, the whole nightmare on Hydra *was* a Squishy plot. The ramifications were endless, but he didn't have time to think about them now. With several brief sweeps of his weapons this first flock of missiles disappeared, far in front of his own ship, very very far from their target. Veddin headed back out toward the battle.

And another volley of planetbreakers screamed toward Hydra.

Even as he turned his ship to intercept them, he received an image from one of the senships he'd put around Hydra. The image was of hellfire rising from the ocean. One of the fusion reactors had just blown sky high. Even as he watched, the senship's computers analyzed the tidal wave and calculated its future path; Pyrta, the island where Autumn waited, would be destroyed within minutes.

Veddin screamed in primeval rage, as he had when his sister died. "Autumn! Is there a plane around? There's a tidal wave coming toward you. You have to get off the island!"

"My detector reading has dropped to 7.6," she said. Obviously, she wasn't going to budge until they found the jammer.

Hardly coherent as a thinking entity, Veddin directed his ship to destroy the second wave of missiles. As he calmed, he looked back at the glowing readout on the psi detector. "It's still 8.8," he almost howled.

They now had six readings from two machines at three locations, at roughly three times. He shifted the numbers to the *DareDrop*'s computer, but without much hope of a fix on the jammer. There were too many imponderables; and the jammer was moving! They might never get enough readings! Where could the jammer be?

Even as he realized where the jammer had to be, Autumn came to the same realization. "Veddin! The jammer is you!"

Of course! How else would the Squishies get something close enough to Hydra? Somehow they'd planted one aboard his own ship in that last battle.

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Wait, there was another explanation. "Unless my detector's broken," he countered in misery. "I wouldn't be surprised if it's just junk now, after all that acceleration." To check, he'd have to go back to the island, to see if Autumn's readings went back up. Or scan the *DareDrop* in minute detail.

There was no time. Before he could get back to Pyrta he'd have lost them all: The island, the detector, and Autumn would all be gone.

A third salvo of planetbreakers came flashing toward Hydra.

A swarm of Squishy ships blasted their way through the screen of Veddin's fleet at last, and plunged toward the planet only seconds slower than the missiles.

Veddin cut power and unsnapped his webbing. "Autumn, listen carefully." He stepped free from his couch, and ducked out of the control room. "Go get the Shaylohs; you know, the Couple down the hall. Tell them that if we're lucky they're gonna get their powers back suddenly—but *tell them* that they don't have a moment to waste celebrating. First, they have to stop that tidal wave before it kills them and you."

"OK."

"I'm not through yet." Veddin pulled down his spacesuit. "Next, there's a bunch of missiles loaded with jammers, and if the jammers get close enough, you're dead. You have to stop those." He struggled the last inches into his spacesuit. He wondered how great the range of those jammers was; if it was as great as the jammer on board the *DareDrop*, Hydra was sunk. Fortunately, there wasn't enough room on each missile for a big power plant. Probably the one on the *DareDrop* had tapped into the *DareDrop*'s engines.

"OK."

"Wait. There's a bunch of planetbreakers coming with the jammers. If any of those get to your planet, there'll be nothing left but a dozen small moons." He plunged through the narrow passage to the airlock.

"OK."

"Shush. There's a fleet right behind them, loaded to the gills with more of the same. And the rest of the fleets are breaking through now." The outer port opened up, and Veddin poised at the opening. "And Autumn, I love you," he sobbed.

"Veddin!" he heard her cry before he leaped from the ship.

He pointed his retrojet at the ship and pushed himself away as fast as he could accelerate; minutes before, when he first knew what he had to do, he'd had his fleet fire a dozen missiles at the *DareDrop*. Even one hit would obliterate the ship and any jammers that she might carry.

He didn't really have a chance of getting far enough away; the missiles were just seconds from contact when he jumped through the portal. One after another, twelve explosions sent blinding pulses of light that his helmet filters could only partially block off.

It had been stupid to try to escape, Veddin now realized. His radiation meters leaped to frenzied peaks. At least on board the ship his death would have been quick and painless. He sighed.

With faint curiosity, he turned toward the planet. There was no way he could see from here whether the tidal wave had struck.

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He turned back toward the fleets and the volleys of missiles, glowing brightly as they needled toward Hydra. They were beautiful needles, quite hypnotic in their movement as they slowly bunched together.

The widespread points of light closed together, and dissolved in a titanic explosion of brightness that excelled even the brilliance of the *DareDrop*'s demise.

The planetbreakers had blown the jammers to smithereens, Veddin realized. Then he noticed Autumn's song in his heart, so soft now, yet so unforgettable. He felt like rejoicing, until he felt the guts of his radiation-torn body coming up his throat, looking for someplace else to go. He remembered he was dying.

Then he was gone from there, no longer a part of his dying body. Now he was trapped in a multiple mind.

He was dimly aware that the Shaylohs were a part of that mind. "We are sorry," the mind said, "we would request your assistance, but there is no time, and we know you would volunteer, if time permitted." With that the mind swept, not merely around him, but *through* him. Everything he knew of space, of war, and of alien beings, was theirs. There followed a contemplation too brief and too intense for Veddin to understand. The mind opened a window on a brightly lit scene filled with warships. On board the ships were points of light; points that were somehow more like the mind itself than they were like the flares of the engines, and as he watched, those points of light dimmed and disappeared by the thousands. Other forces, yet again different in their appearance, grasped the ships and twisted them into the distance. The battle was over.

But the mind was growing; more and more Hydrans were finding themselves and joining the attack. With them they brought power, and hate. Soon the hate grew stronger than any of the other forces there, a lust for revenge that exploded as the members of that mind remembered and thought and searched, to see that other minds, the minds of friends and lovers, were missing, were gone forever. Wild with pain and hate, the mind shifted, passing thousands of stars to a planet covered with bright points like those once carried by the ships in the alien fleet. In a single shuddering pass through that planet, the mind snuffed out every last point of light.

The mind shifted again, to another system. Here there floated several planets covered with light. For a moment the mind paused. It considered which to destroy next.

Till now everything had moved too fast for Veddin to comprehend. But he understood the half-planned genocide that that mind would commit and, though Veddin too had reason to hate the Squishies, he was appalled at the totality of the coming annihilation. "Wait!" he cried into the agonized consciousness. "You can't just kill them all!"

The mind was well shielded. It fully expected some type of attack from the Squishies; it relished the thought of destroying the attackers. But the mind was not prepared for an attack from within.

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"You must stop!" Veddin cried with all his resolve and determination.

The mind stopped. And the people who composed that mind stopped, and thought and saw what they had done, and were horrified.

The separate minds (for they were one no longer) turned to Veddin. "Thank you."

Veddin relaxed. The minds shifted away again, back to Hydra.

And Veddin found himself in a spacesuit filled with vomit and blood. His stomach still heaved to drive more forth. He had forgotten that he was dying.

Pain: blinding pain, fire screaming through every cubic centimeter of his soul. He tried to twist and turn, but couldn't even tell if he succeeded; he could feel nothing beyond the pain. He wondered if this was what it felt like to die of radiation. No, that couldn't be; he should already be dead. Could it be that the ancient religions had told the truth after all? Could this be Hell?

Somewhere amidst the pain there came a chuckle; certainly it was the Devil. "No," the voice said, regretting its earlier amusement. "Fear not. This is not Hell, and I am not the Devil, though I can surely understand why you might think that. Hold on to your sanity for just a few moments, and you'll be free."

The pain subsided. A gentle rolling motion replaced the agony; he must be in a flotation tank. Ungluing his eyelids, Veddin looked up through the transparent case. A couple stood there holding hands, smiling at him. He rolled in the tank, reveling in his release from pain.

"We're sorry about the pain," the Couple told him, "but we haven't found a method to prevent it. It's a pretty wracking experience, for a human brain to have psikinetic Couples and receptor Couples stomp around, rebuilding each individual cell." The man shook his head. "It was pretty horrible for us, too."

"Sounds like it." Veddin marveled again at the powers these people had. He forced himself to remember their weaknesses as well.

He tensed as he felt the song in his heart growing stronger. "Autumn," he cried. "I have to get out!" As he beat against the tank lid, the Couple unlatched it. Veddin jumped out of the tank into the cool air, and became acutely aware of his nakedness.

The woman handed him a towel. The man turned to a closet and pulled out some clothes. "Autumn will be here in a few minutes," they thought soothingly, completely misunderstanding his panic. "We've found it unwise to let touched-ones be present during cell-rebuilding operations; often the pain damages them even more than it damages the person being worked on."

Veddin's thoughts were incoherent. Finally he considered his ship, and was horrified. "The *DareDrop*," he thought in anguish, "she's gone." He looked wildly at the Couple, his mind filled with need.

"We think they've rebuilt one of the alien vessels for you, a replacement for the *DareDrop*." They were puzzled by his interest. "It's not the same, but it should serve most of the functions. Frankly, it'll be more comfortable, if the images of the *DareDrop* in your mind are any indication." The Couple

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smiled. Veddin received from them an image of the hall outside. He saw himself walking down the hall to a door, through which the landing field could be seen. "It's just outside."

With a final tug at the sleeve of the ill-fitting shirt they'd given him, Veddin dashed from the room. "Thanks," he thought over his shoulder.

As he broke from the building, he could feel the gentle pressure from his embedded shiplink. He turned left as the *DareDrop II* told him which way to go. He ran with increasing terror. A different kind of shudder formed inside of him; Autumn knew something was wrong.

Suddenly he was fighting his way through molasses. He worked harder with each step he took. At last he could go no farther.

"Stop," a mind projected at him. He was trapped.

"Let me go," Veddin begged. Autumn's song was pure with love now, and it grew closer. He turned to see Autumn approach, concern on her face. She jogged toward him as she saw his agony. "No!" Veddin screamed in voice and thought.

Now Autumn slowed to a stop. Her muscles strained as Veddin's had. "What's wrong?" she asked. Her parents were coming up behind her; they too looked concerned.

"Don't touch me!" Veddin said.

Autumn choked. "Why?" her voice wavered.

"Surely you know why! Do you want to wind up like the rest of the creatures here?"

"Calm yourself," the Westfalls commanded, "Your thoughts are chaotic."

They were right. Veddin forced himself to breathe deeply, slowly. He had panicked back in the flotation tank, and the panic was irrational. Touching Autumn would not turn him into a vegetable. He remembered that Couple they had met near the spaceport, helping people get indoors. They had been together almost a year, and they had still been able to act in the crisis.

Perhaps he could Touch Autumn, to try to explain . . .

No, he couldn't. Emotionally, he *wanted* to Touch her, to become a Couple with her. She could fulfill needs that he'd never admitted needed fulfilling. If he Touched her, he would never let go. Better not to even try.

Why did he have to love the woman whose touch would leave him crippled?

"What a foolish thought," Tarn and Tara Westfall interjected. "Our reliance on psi is no more crippling than your reliance on electroptics, Kaylanxian. What if Kaylanx's central power generators disintegrated? We, the psis, would have to save you, as you saved us. The difference is minimal."

"No!" It wasn't the same, but it took Veddin a moment to put it into an organized thought. "There is a difference. If Kaylanx lost her generators, I'll grant that she would probably die. But I would have *tried* to save her." They had freed his arms; he swept them over all Hydra. *"You didn't even try!"*

The Westfalls withdrew in embarrassment for a moment: another Couple, the pair who controlled Veddin's bonds, came in. "That is not an indictment against us either, Veddin Zhukpokrovsk. That is a tribute to you as an individual. Do you really believe all

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Kaylanxians share your will to succeed? How many of *them* would work with you if the lights went out on Kaylanx? How many would stare in horror and amazement, waiting for salvation, as we did?"

Veddin had no answer.

The Westfalls returned. "We're all a bit overwrought from the past two days' nightmare. It's difficult to discuss this unemotionally. Wouldn't it be better to postpone decisions for a few days, to let the light of objectivity begin to return?"

If he stayed long enough, Veddin knew he would lose. Touching Autumn would be so easy.

Pax flowed from the Westfalls. "How deep your conflict runs, Veddin Zhukpokrovsk. One part of you feels you must stay, and another part thinks you must leave." They paused. "Stay, Veddin. The emptiness that holds you is ancient, born in Man's beginning, before Nature stole from us the right to Touch. Few Men ever get the chance to share the joy once meant for us. You would search forever for the answers you can find here with ease. Without Autumn you will never be free."

"And with her, I will never be free." Veddin turned away, not even noticing that the molasses that bound him was gone.

"Don't go." Autumn begged. "Come with me. Please. See Hydra through my eyes. It's beautiful here." She stretched her arms toward him. "I love you."

"And I love you." He shook his head. "But there *must* be another answer, a better answer. Don't you see—it's us, the isolates, that make Couples strong. To forego our isolation is to make us just like the Squishies. Is that a worthy goal? The children who grow up here, Coupled from birth, are they lucky never to know what it's like to be Men? The answers that Hydra offers are no better than the isolation most humans suffer."

There was the mental equivalent of a polite cough in Veddin's mind, and the Couple that had bound him spoke. With a start, Veddin recognized them: they were the Shaylohs. "We don't pretend to have any answers," they began, "but we do have an alternative for you to consider."

Everyone was alert to the new thought. "Yes?"

"We have studied the psi-resonance jamming technology in depth since the battle. We could give Veddin a small implant that would locally jam psi-resonances. That way, he could touch Autumn, without Touching."

"Ingenious!" the Westfalls thought.

"Marvelous!" Veddin replied.

"Not on your life!" Autumn shrieked.

The Shaylohs focussed their attention on Autumn. "Would you rather lose him completely? We will design the device so that, if you ever succeed in convincing your touched-one that it is unnecessary, he may deactivate it."

A long moment passed while Autumn considered the compromise. "All right," she muttered.

A twinge of pressure formed under Veddin's left temple, then disappeared. Autumn broke free of the restraining psiforces and ran into his arms. Again Veddin felt the dim echo of a true Touch. It would be so easy to complete the sensation . . . yet, he believed, it would be so wrong. There must be more

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to mankind's destiny than just being like the others. He was convinced of that, though he couldn't say why.

He heard Tarn Westfall's hoarse voice—apparently the jammer blocked mental transmissions as well. "Good luck to both of you. Veddin, may your compromise bear new and interesting fruit." Tarn looked at Autumn and almost laughed out loud. "And you, my daughter, may you be successful in ending the compromise to your advantage." Now he did laugh. "I don't know which one of you to bet on."

Veddin hugged Autumn. She responded in kind. He whispered, "Do you have anything you want to take with you? We're leaving for Kaylanx, you know, at least for a short time. I can't stay here, not now. The next destination after Kaylanx, I leave to you."

She shook her head. "I suspect the Shaylohs have already put my things on your ship. That's just the sort of thing they'd do."

"Very well. We'll go see."

They turned toward the waiting starship. Hand in hand they went, still alone, but now at least together. ■

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Jay Kay Klein's biolog

● [illegible] Mudd College's most [illegible] Robert A. Freitas, Jr. point out that this oddly [illegible] small school in Claremont attracts a highly talented student body. There he received [illegible] physics and another bachelor's [illegible] psychology. He had started out life in [illegible] Maine, but was quickly relocated to California, where he has lived [illegible] except for nine childhood years in Brazil.

At Harvey Mudd Rob tried his hand at writing science fiction, even turning out a [illegible],000-word novel about a "first contact" with aliens. He says he's sure that although it wasn't bought, a major publisher did get as far as page 41 of the manuscript before that's where the inevitable editorial coffee stain was located.

In 1974, while paper-chasing at the University of Santa Clara, he began to write seriously to relieve the tension of first year law school. No sales came of his ventures into science fiction, but his attention became focused on the subject of extraterrestrial life. Now, Rob thinks this is becoming a lifetime research project. He has written a few chapters of another science fiction novel about aliens when he realized there was no comprehensive scientific treatment of the subject at all.

The resulting 400,000-word treatise with 500 illustrations is the culmination of six years of research and writing. Its title, *Xenology*, is a term intended by the author to designate the field of study. It was coined by Robert Heinlein in a novel.

This lifetime topic now firmly in hand, Rob sold his very first piece to *Analog*, appearing in the April 1977 issue: "The Legal Rights of Extraterrestrials."

A year later he received a *Juris Doctor* degree but decided to engage in full-time science/speculative fact writing and editorial consulting. He has been a fellow in two summer studies on space-related topics sponsored by NASA and ASEE. He is also the director of Space Initiative, for whom he wrote and edited the original space activist's "bible," *Lobbying for Space*. This continues to be updated each year.

Rob holds memberships in AAAS, Astronomical Society of the Pacific, World Future Society, Planetary Society, Smithsonian Institution, and the L5 Society, as well as being an Associate Fellow of the British Interplanetary Society. As a further extension of his interest in alien life, he conducts research into advanced automation and machines that reproduce themselves, plus the subject of human/nonhuman ethics. He reports that formal incorporation papers for the Xenology Research Institute were submitted earlier this year. ■

Dr. Robert A. Freitas, Jr.

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Dr. Robert A. Freitas, Jr.

ALIEN SEX

Reproduction takes many forms even on Earth—and profoundly influences other aspects of life. In a universe teeming with life, the variety must be far greater, and the influence no less.

Of all the important things lifeforms do, self-reproduction seems quite unique. Deprive an animal of its food or drink, draw off its blood, or cut away its skeleton, and it dies. But prevent an animal from reproducing and, usually, nothing happens. The species may eventually become extinct, but the individual organism lives out its lifespan. Reproduction of self is an important asset but is not absolutely essential for life—even on Earth.

This is true despite protests that self-replication is somehow the entire point of biological activity. The vast majority of social insects never engage in personal self-reproduction, yet these species are extremely successful. The anatomy of domesticated turkeys has been altered by breeding for plumpness so that these animals can no longer mate in the natural way and must be artificially inseminated with human help. A number of higher Earth species such as the mule are quite sterile, yet do not become extinct.

Indeed, an intelligent extraterrestrial race might lack the capability of individual direct self-replication. We might imagine two closely allied nonsentient alien species among whom, when a successful interspecies mating occurs (or in a special way or in a special environment), sterile *but intelligent* "mule" offspring are the result of the union. Clearly there is no bar to the rise of intelligence in such a situation—the hybrid's brain mass, neural complexity, or level of organization may be qualitatively greater than those of its nonsentient parents. Our intelligent but sterile race would maintain their numbers by corraling and manipulating the "dumb" mixed parental population much as stockmen raise choice cattle and stablemen breed champion thoroughbreds.

It is entirely possible that some very complex extraterrestrial living creatures may have no need to reproduce themselves at all, either personally or at the species level. One class of such beings might be self-creating but non-replicat-

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[illegible] analogous to very advanced species capable of making [illegible] repairs and of upgrading their [illegible] mechanisms periodically. Other [illegible] structure lifeforms might increase their numbers simply by physically expanding and then dividing into [illegible] of various sizes—biomass increases as easily by growing to larger volumes as by replicating a large number of small originals.

There could even exist a race which evolves by means of acquired characteristics. Such lifeforms would neither die nor reproduce, but would instead modify their parts to survive in a changing environment. Selection would act internally on their constitutions, rather than on a succession of descendent organisms. The closest analogies, according to Dr. P. H. A. Sneath, are terrestrial soils which don't reproduce in the usual sense but are complexly organized systems nevertheless. Soils respond to environmental changes, arise where there is rock and wind to erode it, and are virtually immortal. If ever they tried to "compete" with their neighbors, such soil-like organisms would blend together with a total loss of individuality.

Finally, reproduction is not a prerequisite for sex. Two dissimilar growth systems could trade genetic information about their expansion patterns, then each continue growing in a slightly different way. This would be an example of "sexual growth" without replication. Of course, self-reproduction does have many advantages. Whole-body duplication allows rapid dispersion into new niches and produces abundant biological alternatives upon which natural selection may operate. It is a telling observation that most complex terrestrial creatures are capable of self-replication. Assuming Earth is a typically exotic planet, we should expect that many, though certainly not all, extraterrestrials will be reproducers.

Is Sex Necessary?

If reproduction is a useful convenience for a species, sex seems almost pure luxury. Certainly there is no fundamental reason why evolution and diversity cannot thrive in its absence. There is no universal law prohibiting asexuality.

In fact, asexuals can be vastly *more* prolific in the short run. Microorganisms churn out literally billions of copies in the space of a few hours, relying almost exclusively on such simple techniques as binary fission and budding. No "opposite sex" is customarily required. While it is true that many sexual species are also quite fecund, as a general rule fewer offspring are produced than among the asexuals.

Furthermore, asexual reproduction is good economics from the personal point of view. An organism which copies itself without sex passes undiluted its entire genetic heritage to its young. Offspring are exact duplicates of the originals. A bisexual parent, on the other hand, normally contributes only *half* of its own genes towards the construction of an offspring. The other half must be donated by the second parent. From the standpoint of the selfish gene, sex entails a rather poor profit margin in comparison to no-sex.

Except . . .

A completely asexual species produces a population of virtual duplicates,

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save an occasional mutation. Since variation is the raw material of evolution, and the lack of sex decreases the breadth of this variation, such creatures are a distinct disadvantage when competing with their sexual brethren. New genetic combinations in asexual species can accumulate only by a sequence of fortuitous mutations in the same family lineage. Asexuals must "stand in line" to wait for a series of rare mutations. Change spreads only slowly through the gene pool.

Sex allows the accumulation of variation in parallel, rather than in series. In a sexual species many new genes can spread rapidly throughout the population because gene-jumbling produces a novel combination (possibly of several new genes at once) with each act of reproduction. Rare mutations become more widely distributed. So great are the advantages of sex that even many normally asexual organisms have occasional sexual encounters to beef up the waning gene pool. This is especially true in particularly harsh or rapidly changing environments.

For example, both the freshwater hydra and the aphid reproduce asexually for most of the year. As winter approaches, with hard times ahead, these animals switch over to sexual reproduction. This ensures genetic diversity when the colonies disband and disperse with the arrival of cold weather.

In the billion years or so since its invention, sex has proven remarkably successful—if we are to judge from the fossil record of life on this planet. Sexual species dominate the animal world, and the most widespread and important groups are all but exclusively sexual in their mode of reproduction. What of the creatures of other worlds? We don't know whether all alien species must have chromosomes, genes, or some other information-carrying molecules —perhaps some extraterrestrials reproduce by a process akin to xerography. But two things are clear: Variability is the key to biological complexity and survival, and sex reshuffles the biological data deck nonpareil.

How Many Sexes?

Not all Earth creatures are bisexual. Terrestrial biology offers several examples of multisexual reproduction. One interesting case is the lowly paramecium, which has between five and ten sexes depending on how you count. These are distinct mating forms which arise at different times under definite conditions, and which can only mate in certain specific combinations. Another example is certain quadrisexual fungi, notably *Basidiomycetes,* in which there are four distinct sexual groupings. Among the higher animals, greylag geese display an evolved sociobiological "behavioral trisexuality." One goose "marries" and mates with two male ganders. Multisexuality is clearly a viable alternative.

Why, then, are the vast majority of terrestrial sexual lifeforms bisexual?

The answer seems to be that one sexual partner is just enough to properly shuffle the genetic deck. Each healthy individual has a reasonable chance of mating with a member of the opposite sex. Apparently, two are both necessary and sufficient. More than this may seriously impair the chances for species continuity. The more sexes required for

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[illegible] reproduction, the more difficult it is to bring them all together in pairs at just the right time. The [illegible] the number of links in the mating [illegible] the greater is the chance that the species may become vulnerable to certain predators or other environmental [illegible] thus jeopardizing the future of the entire race. And it is not clear how, say, three sexes could generate variability very much more effectively than two.

So while extraterrestrial multisexuality cannot be ruled out, requiring more than two sexes for reproductive activity seems an unnecessarily complicated solution to a problem elegantly resolved using only two. It's a safe bet that bisexuality is the overwhelmingly dominant mode of sexual reproduction among the alien lifeforms in our Galaxy.

The Bisexual Universe

Assuming that most sexually-reproducing ETs will have just two sexes, bisexuality does not necessarily demand the existence of distinct male and female forms. A case in point is the black mold *Rhizopus nigricans*, which displays an unusual form of reproduction known as heterothallism.[1] This species of fungus is bisexual, inasmuch as two organisms are required for fertilization and replication to take place. However, the two sexes are physically indistinguishable. There are no constant differences between members of opposite mating groups other than their reciprocal behavior when crossed. Thus, it is impossible to designate one form of the black mold as male and the other as female. Customarily the complementary groups are labeled merely "+" and "−" for convenience during experiments.

One can imagine a race of intelligent extraterrestrials apparently unisexual to our undiscerning eyes but which actually practice heterothallic sex. Such beings would most certainly lack secondary sexual characteristics, those hormone-induced physical landmarks such as beards and breasts to which we humans are so pleasantly accustomed. They might even lack distinctive primary sexual characteristics such as internal or external gonads. Norms of marriage, inheritance, language, religion and social behavior would be profoundly affected by this state of affairs. The usual social tensions caused by sexual competition in human cultures would be more diffuse in a society in which every member was a potential mate and in which all could become pregnant, though sexual undercurrents might arise in all interpersonal relationships. The disparate male/female roles in human social roles and courtship rituals would defy their understanding, and to heterothallic ETs, human males—who participate in reproductive acts for pleasure but cannot become pregnant as a consequence—might be judged especially pitiful, handicapped, even perverted creatures.

Assuming maleness and femaleness exist among most bisexual alien species, there are again major variations in Earthly biology. It is quite possible to have an organism which is neither strictly female nor strictly male, but rather exhibits some alternating or intermediate condition. For example, simultaneous hermaphrodites possess at once both female and male sex organs.

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Ovaries and testes are present together in the same individual. Matings occur in pairs, with each partner serving both sexual roles at the same time. Planarians, earthworms, sponges and snails fall into this category, and a few simultaneous hermaphrodites among the more highly evolved vertebrates are known, such as the banded flamefish *Serranus subligarius*.

Such intersexual animals can be sex-mosaics in time as well. Many creatures start life as one sex and finish it as another. These sequential hermaphrodites come in many varieties. For instance, in protoandry an animal is first male and later female; proterogyny is the converse, with young females metamorphosing into functional males as they age. Or the process can be cyclical. Oysters are born as males, then spend the rest of their lives switching back and forth between male and female in irregular cycles a few months long.

What would a society of sequential hermaphroditic aliens be like? We can take a few clues from the life history of the freshwater shrimp *Gammarus pulex*. Each of these individual crustaceans is both male and female, but not at the same time. Newborn animals spend early life in a neuter stage, after which they pass through puberty and enter the first sexually active phase as functioning males. After a while, the maleness is exhausted. Latent ovaries ripen into maturity, and the organism spends the remainder of its life as a full-fledged female. Eggs are shed by middle-aged mothers and are fertilized by energetic youthful males still in the middle of their first cycle.

It is a magnificent bisexual system, one which works quite well on Earth. No individual is excluded from any phase of the reproductive process. Still more significant, each member of the colony plays both male and female roles during his/her life. Drawing an analogy to the human life cycle, zoologist Norman J. Berrill of McGill University in Montreal imagines that all halfgrown individuals, about ten years old and weighing about 34 kilograms, would be males—the only males—ready to act as such both sexually and "probably in other wayward ways."[3] Like their truly human counterparts, as troublemakers they would be kept in line by a closed society of matriarchs, roughly equal in number to the males but each twice the size and much older and wiser. This wisdom would be not merely of a general character, as among human parents, but also in the special sense of each having been a male herself, as understanding as a mother with a child and as little likely to put up with any nonsense, perhaps wistfully looking back to her youthful manhood. Womanhood would bud as usual when masculinity had faded, with growth continuing and full female maturity yet to come.

The institution of monogamous marriage as we know it would be quite impossible in such a society. Husbands would be forever changing into wives and males would be too immature psychologically to be treated as other than "child-lovers." Such pedophilia is viewed as a sexual perversion in many human societies, but for our intelligent shrimps it would seem quite normal. Incest prohibitions might be inordinately complex, since all fertile middle-aged females in the family in theory

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[illegible] the negative effects of [illegible] exchanges of matriarchs [illegible] between families, doubtless accompanied by the same pomp and ceremony as upon "giving the bride away" in our society. Love in the traditional human sense probably would not exist—females could have strong affective and familial non-sexual ties with other females, whereas relations between females and males would be characterized more as controlling playfulness than by affectionate cooperation. Our usual concepts of male/female love might seem quite alien to them.

Xenogamy

Given these tremendous potential cultural and biological differences, one wonders if meaningful interspecies social-sexual relations would be possible at all between humans and extraterrestrials. Many science fiction authors have tried to deal sensibly with this touchy question—such as Philip José Farmer in *The Lovers* in *Flesh*, and in *Strange Relations*; Walter Tevis in his *The Man Who Fell to Earth*, and a host of others. There have been "reports" of sexual molestations of humans by the occupants of UFOs. And "Star Trek"'s own Mr. Spock is a prime example of xenogamy—the product of a marriage between a human female and a male alien from the fictional planet Vulcan.

It is not at all implausible that interspecies copulation can occur. Given the prevalence of the complementary male and female organs throughout the animal kingdom on this planet, such activity may indeed be possible even between creatures of "gross morphologic disparity." Alfred Kinsey's researchers turned up accounts of attempted couplings between a female eland and an ostrich, a male dog and a chicken, a female chimpanzee and a tomcat, and a stallion and a human female. Obviously, relations between humans and other beings even roughly humanoid in shape can happen.

If such activity is possible, is it likely? Could humankind and an alien race derive sexual pleasure from mutual physical encounters? These are very difficult questions, mainly because the ET is such an unknown quantity. Extraterrestrials may have organs, appearances, sensitivities, and responses wholly incompatible with any conceivable human style of lovemaking.

And yet—in 1948 Kinsey reported that some 17% of all rural farmboys had experienced sexual congress with various barnyard animals, and had achieved orgasmic satisfaction in this way. (Less than a tenth of a percent of all females interviewed admitted such coition, although 1.5% of the sample reported *some* form of sexual contact with animals.) If bestiality occurs so regularly among human populations, can we state with any assurance that "xeniality" will not also occur when humans mingle socially with alien races? The evidence, scanty though it may be, suggests that interspecies sexual contacts are not only possible but probable.

One last question remains. When humans and aliens sexually join, will anything result from the union? Again, this is a difficult question because an unknown alien physiology is involved. Different species on Earth have been mated successfully from time to

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time—for instance, the hybrid offspring of a mallard and a pintail duck is fertile.

In 1975 a chance mating of two very different species of ape in the Grant Park Zoo produced the first reported ape hybrid. The offspring, dubbed a "siabon," was the result of a mating between a male gibbon and a female siamang confined in a single cage. "Obviously," remarked one researcher, "they had been sexually involved for some time." Gibbon cells have 44 chromosomes, whereas siamang cells have 50, and thus are farther apart genetically than human beings and the great apes. The "siabon" offspring, believed sterile, has a mixed bag of 47 chromosomes—22 from the father and 25 from the mother. Still, in the first analysis, xenobiologists recognize that interspecies fertilization, and especially hybrid fertility, is a rather rare phenomenon.

In the context of extraterrestrial matings, natural interspecies fertility should be even rarer. (Of course, with advanced technology almost anything may be possible—the first interkingdom clones combining plants and animals were achieved during the late 1970s.) We know that slight changes in the environment can cause enormous variations in planetary biochemistry. Nucleic acids, genes and codons may not be needed by ETs, or these may be essential but in different forms than are found on Earth. Many complicated and highly unlikely coincidences must occur for an alien/human mating to produce viable results. The two species must have identical amino acid sequences for proteins (assuming they even have proteins), the same optical rotation in their biomolecules, closely matched chromosomes with similar size and shape, the same kinds of genes located on the same chromosomes at the same locations, and so forth—all of which is highly improbable.[5] It has not even been shown that humans can produce interspecies offspring with their own closest biological relatives—apes and other primates who share most of man's biological heritage.

So interspecies matings involving humans aren't likely to result in pregnancy. If pregnancy somehow does occur, the hybrid offspring probably won't be viable. (It has been estimated that up to 50% of all *normal* human pregnancies may end in spontaneous abortion.) Finally, if somehow viable and carried to term, the interspecies hybrid will most likely be sterile or maladapted for natural survival, much like the mule or the liger. Hybrid vigor is unlikely in the offspring of parents of such widely varying genetic constitution.

This does not augur well for Mr. Spock. ■

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(Continued from page 10.)

If you're reading this magazine, you probably think science is a good deal *more* than just another superstition in which to place blind trust, and as such deserves a less fickle following. I agree—but I don't think it will get that kind of following until the general public can be made to understand that the kind of faith science deserves is of a considerably subtler kind. Unlike "other superstitions," it doesn't claim to be infallible. It recognizes and even quantifies its own limits. It has definite procedures for improving its own performance. It actually claims less in the way of present capabilities than many other belief systems—but it can *demonstrate* more, both in present capabilities and in reasons to hope for a still better future.

Everyone has been *told* these things, but few have really grasped them. So they continue hopping from belief to belief, seeking easy absolutes that don't exist—and so they will continue until such time as they come to understand that there is more strength in a tool which admits it has limits and knows how to work within them and can *learn* from its mistakes.

When (if ever) that will happen, I could not venture to guess. But it seems a worthy goal—and a formidable challenge—for educators who take their work seriously. ■

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THE GARDEN

Michael P Kube-McDowell

If public education dies, what will take its place?

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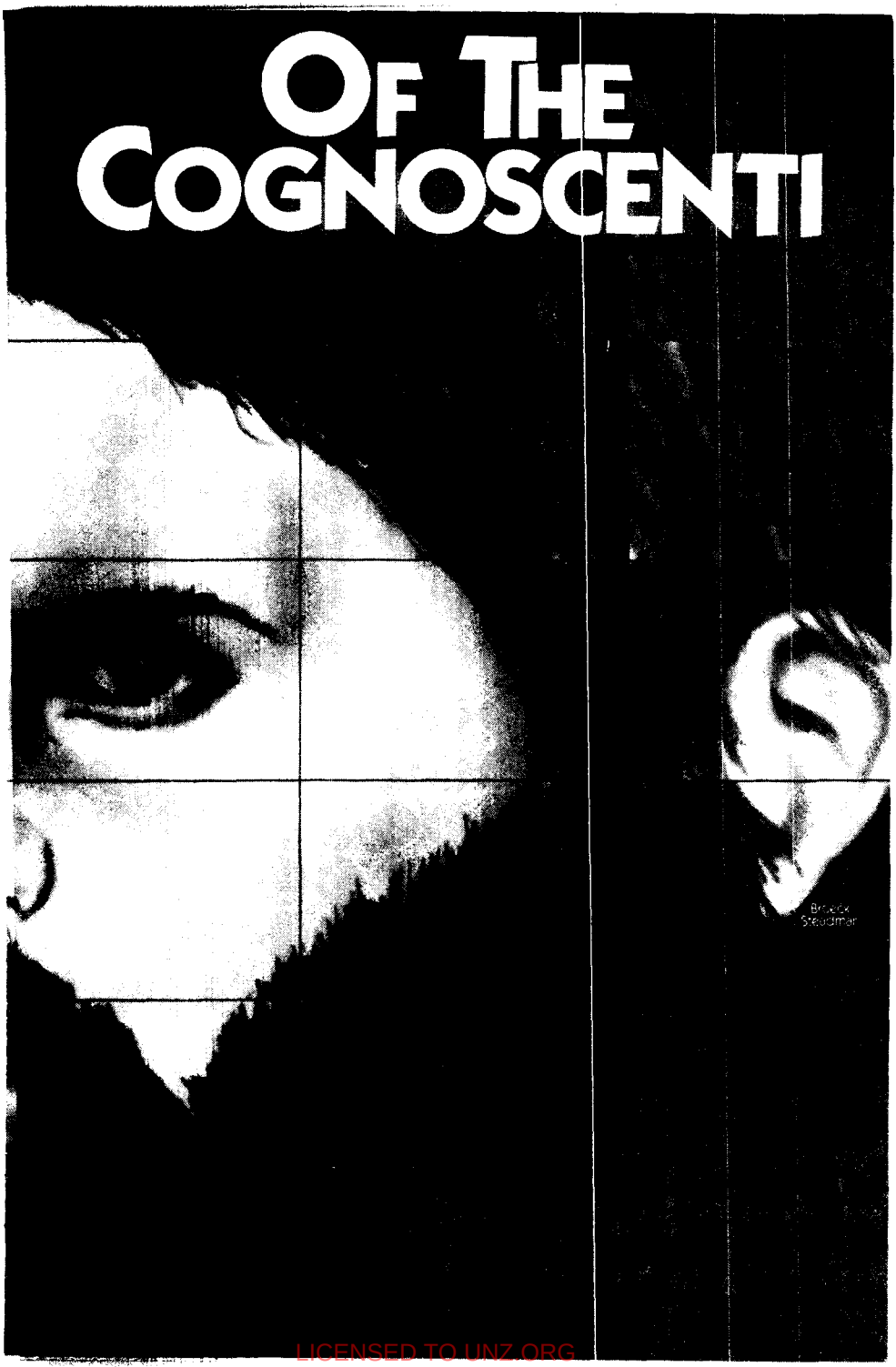
Of The Cognoscenti



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When he returned from lunch to his seventh-floor cubicle in Elgar Industries' Corporate Affairs building, David Kennerly found the blue message light on his work terminal winking patiently at him. Slipping into his chair, Kennerly called up the message. Since he had left most of his coworkers in the lunchroom debating the merits of various commuter bicycles, Kennerly expected to see the face of Crystal, his contract wife, appear on the screen.

But the message was all text, and not from Crystal. Under the navy-and-rust messagehead of the Educational Coordinator, Elgar Industries, it regretted to inform him that:

We were unable to place your son in Elgar Industries Schools Class of '22.

Your son has many fine qualities and we are certain you will be able to find an appropriate position for him. With the growth of the Elgar family, we had this year an unusually large and talented crop of applicants. Our action on Martin's application should not in any way be considered a negative evaluation of Martin's potential.

Thank you for your interest in Elgar Industries Schools.

The memo was signed by a D. M. Stein.

Kennerly reread the brief message, as if doing so would change its contents. Then shock gave way to anger and dismay. I didn't know they could do this, he thought. I thought they had to take him. I'm a five-year employee. I should be vested in the family ed program.

Guiltily, Kennerly remembered how casually he had taken the application, transmitting it just one day before the deadline. Not even wait-listed! Kennerly felt a sudden rush of shame. Glancing furtively over his shoulder to see if anyone had seen, he purged the message from his screen.

There must be some mistake, he thought angrily. If not, I need a better explanation than this. This Stein can't brush me off with a memo. This is my son's future we're talking about—his career.

Kennerly asked his terminal directory for D. M. Stein's number and location. We'll see about this. He can't take us so lightly. This is a fringe benefit, not a gift.

The terminal produced the requested information. Good! He's here—Building Five. Indignation overpowering his other emotions, Kennerly put in the call.

At least Martin won't give me a hard time, thought Kennerly as he waited for the connection to be completed. Three-year-olds have more pressing concerns. . . .

Chapter 4: ". . . I Owe My Soul to the Company School"

The philosophic model for all the corporate schools which were to follow was the General Motors Institute, of which it has been said that its graduates were in some ways more carefully engineered than the products they went on to make. But without a doubt, the High Priest of the CorpSchool awakening was D. Howard MacIntrye. In the early 1980s, MacIntrye, after much wailing and gnashing of teeth, set up the first school with the express purpose of turning the deficient graduates of government schools into employable human capital. "It's a quality-control problem," said

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ne from his business-magazine pulpit. "Think of it as dropping an unreliable supplier, and you'll feel better about it." The faithful listened and obeyed.

—from Griveny's *A Survivor's Affectionate History of American Education: 1950-2000*
(by permission of the author)

Deborah Marie Stein's office was lit more effectively by her 200-watt smile than by the light diffusing through the tinted glass window. But the window carried more information value. It told Kennerly that the Education Coordinator stood more highly in the corporate perquisite hierarchy than he had realized. Even worse, Stein was a woman —an outstandingly attractive woman. The two facts together banished most of his carefully cultivated anger.

"I got—I got a memo from you about my son's application," he said, looking everywhere but at her. "I wanted to make sure it was right."

"I wish I could tell you that it was a mistake," she said pleasantly. "But I'm afraid that your son was not selected for this year's class."

"But I thought it was automatic—five years of service and your kids could go free. I even timed Martin's birth so that he'd be tested when he was ready."

"We discontinued that practice last year, I'm afraid. New selection procedures were adopted during the company-wide Overhead Evaluation Program —as I think about it, I'm certain we sent out an all-employee bulletin when it happened."

Kennerly grimaced. He ordinarily purged the all-corp bulletins without reading them, inasmuch as they were usually news of other people's promotions and other equally significant minutia. "Is there a wait-list, then?"

"Yes—but it's short and I'm afraid Martin's not on it. We get very few withdrawals. There aren't many long-term employees who decide to leave us."

He tried to find out from her why Martin had been passed over. But like a county-fair pig, she squirmed away each time he tried to pin her down, leaving him feeling soiled in the effort. Yes, his Education and Employment Prospect Assessment score was above average. No, he had no learning disabilities. No, Kennerly's job evaluations were not a factor.

"I'm sure you understand that the exact criteria we use must be confidential," she cooed. "The primary problem was stated in the memo. There are an unusual number of employees with children in the Class of '22. The competition was unusually keen. In another year—'19, for example—Martin might well have been accepted."

Kennerly slumped back in his chair, conceding defeat. "Well—can you consider him for the class of '23?"

Stein drew back, horrified. "And hold him out of school until he's four? That would be terribly unfair to the boy."

"Why?"

"Why—all his age-mates will be going to school this fall. His friends from the child development center. He'll feel left out, the stigma of being different. Not to mention the impact on his ultimate achievement! The third year is *very* important in getting off to a good start." She leaned forward, elbows on

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her desk. "And what if he should not be selected next year? Four years old—and *still* not in school. That'll be in his records forever, raising questions in people's minds. He'd almost be sure to end up in the government schools."

Kennerly bristled. "What's wrong with that? I went to a government school."

"So did I. They've changed," she said darkly. "Look—take my advice. Find a family ed counselor who knows his way around and put him to work finding something for Martin. I'll transmit some names to your work station. It's really the best way to go. There are nearly two hundred corpschools now. There's bound to be a spot for Martin in one of them."

Kennerly looked unhappy, but nodded and rose. "One last thing—I have to ask. I was a little slow getting the application in. Did that—"

"Only in when you heard, not in what you heard," the woman said reassuringly.

Kennerly smiled wanly. "Thanks."

As he left the office, he nearly collided with a harried-looking, briefcase-laden man. Kennerly mumbled an apology and continued toward the elevator.

The stranger stopped in Stein's doorway. "Hey, Dottie."

She looked up. "Why, if it isn't Ralph the roving recruiter," she said cheerily. "How'd you do on the east coast?"

"Super. I signed five of the seven kids I went after—including one UniTech was after—and I stayed within my bonus budget."

"Fantastic," said Stein. "That fills the class of '22. Come on in. Close that door behind you, and we'll take a look at what you bagged."

Chapter 7: The Fourth "R" Takes First Place

The NeoChristian schools sprang up like weeds in a junkyard—in church basements, prefab buildings, and the room above the garage, garish mutations of a model that had produced exemplary schools under old-line banners. But in their paranoia the fundamentalists saw a humanist, atheist, or communist behind every semicolon, and to shake off their influence science was rewritten, history reinterpreted, and literature reevaluated. The grand smorgasbord of human thought was reduced by the fundy filter to a watery gruel. But it was the diet the parents wanted for their children, and the students were not heard to complain . . .

—from Griveny's *Education: 1950-2000*

Kennerly's home was a second-story apartment an invigorating but not exhausting commuter cycle ride away from the Elgar plant. When he reached it that evening, he made no effort to mask his black mood. He was counting on Crystal to honor their unspoken agreement—that at such times she would neither prod him to talk nor bristle at his inattention, but rather give him time to work it out.

She did not disappoint him. He was allowed to reach the end of dinner with mechanical kisses, monosyllabic statements, and minimal demands from Martin. When the table was clear, he retreated to the screened-in second-story

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porch and knew that no one would follow.

Settling into a chaise facing the river (a klick down a gently sloping bank from their apartment), Kennerly gave his contract wife a silent stamp of approval. She did not ask him to be anything he wasn't, and could not have been a better mother had Martin been her own child. He saw her as a far better parent than he could have been—or was now.

Kennerly was well aware that he was uncomfortable with women—though no misogynist, merely the victim of being an only child and of his own shyness. That was the reason he had sought to have a child without the entanglement of an emotional relationship with its biological mother. It was surprisingly easy to arrange; surrogate mother programs were common, though they still accounted for less than 2% of all births. In vitro sperm sexing had guaranteed that the child would be a boy — Kennerly's only absolute condition. (For though little girls were at least as appealing as little boys, it was a regrettable fact that they invariably grew up to be women.)

But Kennerly had made one crucial error, one that the clinic's cursory counseling failed to detect. He was far more attracted to the idea of childrearing than to its reality. But that, too, was solvable. Within a month of Martin's birth, Kennerly had been advertising for a contract wife.

Crystal had been a find—at 23, eight years younger than himself (and therefore less threatening), pleasant to look at, possessed of modest intelligence but a perceptive wit, at times almost shy. The situation suited her needs; she was a graphic artist of considerable skill but little ambition, and the contract provided security and independence from a daily routine without the penalty of solitude. It was a fairly standard sex-optional contract—sixty-day one-party termination, rights and responsibilities clearly spelled out. One unusual feature was that the contract's term was set not by a date but by an event: Martin's admission to a residential school.

With that thought, the feeling of being trapped, the resentment toward Martin, came back full force. He recognized the syndrome, calling up the memory from a parenting class. This feeling of responsibility without control was the first step toward parent burnout. Of that the counselor *had* warned him, and from that Crystal had shielded him—until his tidy plan for Martin's future fell apart. And there would be no putting it back together; Elgar was hiring fewer and fewer people they had not trained in their own schools. Kennerly felt a great unfocused hostility—toward Elgar, toward Stein, toward the inventor of E&E assessments for three-year-olds, toward Martin for existing, toward Crystal for what she would think when he told her, and, because there was some left over, toward himself.

A noise to Kennerly's left made him turn his head. Crystal stood in the doorway in her robe.

"It's Candice and Tom on the phone," she said gently. "Are we interested in a party Saturday night?"

"I suppose so. Any special occasion?"

"Their boy was accepted at IBM El-

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ementary. You know Candy and Tom—any excuse to open the bar."

Kennerly's face became rigid. "Tell them no," he said curtly, and turned away. Crystal lingered in the doorway a long moment before leaving. *Good girl,* he thought. *I don't want to yell at you.*

Kennerly lay on the chaise and stared out through the screening at the distorted blobs of light marking traffic on the river. He was only vaguely aware that his teeth were clenched, of the tightness of his grip on the chaise's aluminum arm, of the tension in his neck and shoulder muscles. His thoughts were focused on the past. *If I'd done the right things, he'd have been accepted,* was the general thrust.

Then movement, noise, intrusion—it was Martin, wandering onto the porch with a wooden boat under one arm and a doll and a terry towel clutched in the other. Unceremoniously shedding his burdens onto the floor, he went to the screening and peered out into the night, barely tall enough to see over the sill. Nose pressed into the wire, Martin made meaningless wordlike noises of apparent pleasure. Then a moth appeared, startling him and sending him back to the relative safety of his toys. His omnipresent smile did not waver.

Crystal swept onto the porch and gathered up the child and his possessions. "There you are," she said affectionately. "You know it's bedtime, Marty."

"No," said Martin.

"Yes," said Crystal firmly. "Say goodnight to Daddy."

Martin complied, the thumb that had found its way to his mouth garbling the words. Kennerly suddenly realized that, watching Martin, much of the tension had drained out of him. "Come back when you've put him to bed, all right?"

"All right," said Crystal. She seemed pleased.

When she returned, he made room for her on the edge of the chaise. "I saw the Elgar ed coordinator today," he said. "They don't want Martin."

"Ooh. You were counting on that, weren't you. How bad was it? Did they say, 'No, thanks,' or 'We recommend you kill it immediately'?"

Kennerly laughed. "Not that bad. I just hate surprises."

"Misoneist."

"Yup."

Their hands found each other, joined. Hers were cool and soft. "There are *lots* of schools. We could look for a good church school. We could afford it, couldn't we?"

"No, thank you," he said coldly.

Crystal pulled back, reclaiming her hands. "I went to one, you know. I don't think I turned out that badly."

"No, no," he hastened to say. "They're good at some things—like what you're doing. It's just that—"

"What that I'm doing? Childrearing? Or art?"

"Well—both. But you can't get a high-tech job with a church school diploma—"

"Really! Then whom do the Christian Satellite Service and the other twenty Christian businesses in the Fortune 200 hire?"

Her contentiousness spurred Kennerly to lash out. "Well programmed, weren't you? Look—I can't stomach their version of reality. I want Martin

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to know who Shakespeare, Thoreau, and Emerson were. I want him to recognize the rest of the animal world as his relatives. I *don't* want him thinking because he's read one book he has all the answers. All right with you?"

Crystal stood up abruptly. "You want something *better* for him, you mean," she said acidly. "Someplace he'll grow up a little more *tolerant*."

Without the tone you're putting on it, yes.

"Fine." She drew her robe more tightly around her and stalked out.

"Arrgh," growled Kennerly, closing his eyes against the outside world. He rolled on his side, curled in a quasi-fetal position, and mumbled a few expletives as incantations against intrusion. *God, I hope the counselor can straighten this out,* he thought, and shortly thereafter fell asleep.

Chapter 8. The Odd Marriage of Lucifer and Jehovah, or, Why Does Superman Need Lex Luthor?

It took just a sweep of the legislative wand to transform children from prisoners to consumers of educational services. That same wand brought two new players into the great game of education. It was an old drama—agent vs. publisher, union boss vs. corporate legal hound, reporter vs. celebrity—played out in the new arena of the hospital nursery. "In the Center Crib, ladies and gentlemen, the first bout of the evening, the Family Education Counselor vs. the Corporation Talent Scout"—a relationship at once viciously predatory and incestuously parasitic. One unhappy observer viewed the carnage and opined that, "Those old adversaries God and the Devil are at it again, but you need a scorecard to figure out which is which. . . ."

—from Griveny's *Education: 1950-2000*

Kennerly looked up from the nameplate on the desk before him—Philip Tanner, F.E.C.—just as Tanner looked up from the records Kennerly had provided him. "Martin had a surrogate mother?" Tanner asked.

"Yes."

"I don't see her genotypic profile here."

"I don't have one. I never knew who the mother was or anything about her."

Tanner raised an eyebrow. "Not a do-it-yourself job, eh? Didn't you think that was a bit risky?"

"Not all surrogate programs will accept a single father. I had to make some allowances, just as they did."

Tanner clucked his displeasure. "I suppose that means no work history for the mother, either."

"That's right. Is that going to be a problem?"

"Not really. There are plenty of non-corporation schools."

"What? Just like that, there's no chance of admission to a corpschool?"

"That's about the size of it."

"Why?" Kennerly demanded.

Tanner shrugged. "Not knowing the genetic background or life achievement of the mother is two strikes. Combine that with your own mild underachievement—"

"Now, just a moment!"

"That's the way I read it," Tanner said without apology.

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"You mean they won't even look at you without the mother's records? That's—discrimination."

"Yep. And perfectly legal. The private schools were guaranteed absolute freedom in their choice of students, teachers, and curricula. Look—be reasonable. There are fifty applicants for every scholarship position. The company is committing itself to eight years of expense—possibly to sixteen and a job. Why should they bet on a mongrel over a pedigree? Too many people have tried to hide unflattering relatives. If anyone would take a chance on him, I'd say it'd be your own employer."

"If you were right about that, I wouldn't be here," Kennerly said quietly. "They gave me your name."

"Dottie did that?" said Tanner, brightening. "She's sharp. Really whipped that Elgar program into shape. They were one of the last to start recruiting, you know. Well—we'll need to look at your family finances. I have to have a handle on what you can afford before I start looking."

"I'm not sure yet I *want* you looking," said Kennerly. "I just can't believe that no corpschool would be interested in Martin. He's got a good E&E—"

"You pay me to know the market, not to massage your ego and waste your money on hopeless applications and credentials reviews. And another problem you've got—it's late in the season. A lot of the top schools have already closed their classes."

Kennerly sighed. "So what are you offering me?"

"I'm not sure yet. The NeoChristian schools are out—a double whammy with the surrogate mother and the contract wife. Unless you'd care to repent and replace the contract with a vow?"

"Thank you, no."

"Okay. There are about ten independent high-tech programs, doing basically what the corpschools do and competing with them for faculty and students. They keep their admissions open later than most to catch corpschool rejects. We could try them."

"Same deal as the corpschools?" Kennerly was suddenly interested.

Tanner laughed. "Oh. No. You pay them. A lot."

"Well—what about jobs? What happens after graduation?"

"Catch-as-catch-can, of course. But they do well. Another possibility is that your son will do well enough to attract the attention of the corpschools at the transfer points—fourth, eighth, twelfth grades. There's a lot of raiding."

"No. I want better than that for him."

"I'd be misleading you if I told you you could get it. I can't even promise you a spot in one of those schools. You might have to content yourself with one of the main-line church schools—Catholic, Lutheran."

"Give me my records, please," Kennerly said. Tanner handed over the diskette. "Mr. Tanner, I don't like your attitude and I can't buy your conclusions. I'm afraid I'm going to have to go at this another way."

"Really? You can take that portfolio to any other F.E.C. in town and he'll tell you the same thing. If he doesn't, keep one hand on your wallet—he's a crook."

"I'm not going to use a counselor."

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"Oh? You'll do it yourself?"

"Exactly," Kennerly said, standing. "I care more about him than anybody else."

"Do you know what admissions officers call applications that come in without an I.E.C. cachet? The scruff pile. If they're looked at at all. It's by computer. Very few make it in that way. I can guarantee you won't. And you'll end up spending twice my fee to prove me right—while your kid sits in a public school."

"You make that sound like a threat."

"Threaten you? I feel sorry for you. I get a lot of parents like you—unable to face the facts. Your kid learns ten words and two addition facts and you think he's a genius." Tanner leaned across the desk. "I've got a message for you—it's okay to be mediocre."

"You ought to know," Kennerly said agreeably.

The shot went wide. Tanner merely laughed, shaking his head. "Good day, Mr. Kennerly—much patience and luck to you. You're going to need both."

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Enter name of school or "S" for Selection Sort.

S

Enter subset delimiter or "A" for alphabetical review.

NORTH CENTRAL ZONE

3921 entries. Enter additional delimiter or B to begin.

EXCLUDE NEOCHRISTIAN

2218 entries. Enter additional delimiter or B

PARENTAL GENOTYPIC RECORDS NOT REQUIRED

1314 entries. Enter additional delimiter or B.

SCIENCE/TECHNOLOGY TRACK AVAILABLE

1110 entries. Enter additional delimiter or B.

CLASS OF 2022 OPEN

173 entries. Enter additional delimiter or B.

"Jesus!" Kennerly exclaimed.

SCHOLARSHIP PLUS STIPEND AVAILABLE

No entries. Reset to previous level.

TUITION LESS THAN $3500 YEARLY

9 entries.

COED AND MULTIETHNIC

2 entries.

B

East Lakes Academy of Mathematics and Music. Fnded 1987, enrlmnt 116, flltm stff 7, plcmnt 68% (1 yr). Specialty: "fundamental patterns of Universe as expressed in mathematics and classical music" Full report: T-210.

Kenowa Free School. Fnded 1975, enrlmnt 460, flltm stff 18, plcmnt N.A. Specialty: student-directed exploration, "wholistic" development; no required studies. Full report: K-108.

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Six equally unproductive sorts later, Kennerly's amazement had yielded to outrage. Racism, religious indoctrination, and political chauvinism were trumpeted as "specialties"—not always euphemistically. One school promised that all reading materials were so sex-neutral that characters weren't identified by sex. Another assured parents that "one-worlder propaganda" had been expunged from its social studies courses. An all-girl school offered a program to provide its students with the "proper skills and attitudes" for "serving their husbands in accordance with Biblical precepts." There were Klan schools, atheist schools, Scout schools; schools emphasizing astrology, survival training, and sexual fulfillment; schools where instruction was in Spanish, Esperanto, and even Latin. Left, right, or center, Kennerly was appalled by the narrowness—and in that respect, he was forced to admit, his precious science schools were no better than the Neo-Christian schools he despised.

"I won't be a part of this," he vowed silently. "I won't turn Martin over to fanatics of any stripe."

To his credit, Kennerly did not recant when he realized that he had narrowed his options to one.

Chapter 12: "Mom, Meet Miss A-210 Series Five"

SHORT ANSWER: What is patient, efficient, and unprejudiced, treats students as individuals, uses a variety of techniques, and makes only modest financial demands? *The computer-based teaching machine.*

ESSAY: Why did it take the educational establishment so long to catch on? *Silly boy—computers have no union.*

HISTORICAL-INTERPRETIVE: What happened to the displaced teachers—those lacking the academic strength for curriculum development, the practical experience for business, or the moral qualifications for God (that is, most of them)? *Who really cares? It was all their fault anyway, wasn't it?*

—from Griveny's *Education: 1950-2000*

Jessica Adams, principal of Hawthorne Elementary, was not a good actress. Though she rattled off her lines flawlessly—"How nice to meet you—always gratified by parents' interest—very proud of our school—happy to show it to you"—her delivery and demeanor did not convince. What's more, she rushed her monologue—the one about dedication and concern and growth and achievement. Kennerly thought that a shame; they were such nicely turned words.

Ten minutes after he had appeared at the central office, Adams was abandoning him at the doorway to Classroom 100. She urged him to wander freely and satisfy his curiosity, and extended a lukewarm invitation for him to stop back and see her if he had any questions. Her exit was in character; she walked away as though retreating to secure ground.

The high-ceilinged stupa-like classroom was filled with row upon row of chest-high cubicles. Above each cubicle rose a metal stalk tipped by red and blue lights, one or the other of which was lit in most cases. The partitions themselves were decorated with posters, an assort-

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ment of little fuzzy creatures, and a surprising number of what appeared to be award certificates. Stepping closer to a neat's cubicle, Kennerly read the citation on the "NEATEST STUDENT RULE!"

Kennerly stood for a while watching the four adults who were roaming the aisles. The red and blue lights seemed to be for them; presently Kennerly deduced that red meant "I need help" and blue "Yes, I'm working."

The room was noisy—fans, keypads, nasty laughter, many hushed and some not so-hushed voices. Kennerly poked his head over one partition and found a girl he judged to be eight or so intent on the screen of her teaching machine. The word "fountain" appeared there in large letters. The child moved her lips silently, then touched a large green key and said out loud, "Fountain."

"Very good, Ginny," said the machine in the voice of the video actress whose poster hung from one of the cubicle walls. "Let's try another."

"Hi," said Kennerly. "My name's David. Can I talk to you for a minute, Ginny?"

"Go away," the girl said without looking up. "I need ten more points for a music break. Come back after."

Taken aback, Kennerly moved on down the aisle. He stopped several more times—once to watch a mosquito go through its life cycle in an animated computer-graphics world.

"Do you like science?" Kennerly asked the boy in the cubicle.

"Yeah," the boy said without enthusiasm. "It's got better pictures than history."

Alarmed but wary of generalizing, Kennerly moved to another section of the room and asked more pointed questions: What's a verb? Who's the President? Name the ten planets in order. He rarely got right answers, even when he took a question straight from the screen the child had just finished reading. He always got puzzled looks, as though only machines, not people, should ask questions. A half hour later he was back in Adams's office.

"Problem, Mr. Kennerly?"

"Yes! I want an explanation of what I saw out there. Those kids are practically chained to their chairs to keep them working. Or bribed. Or flattered for every little success. If there's one of them that's excited or happy, you're hiding 'im."

"It's summer, Mr. Kennerly. They'd rather be outside."

"I don't blame them! That place is like a factory."

"I believe it was modeled after one. Two students to a cubicle—24 cubicles to a supervisor—four supervisory units under one production manager."

Kennerly blinked in surprise. "Well, it isn't at all what I thought it would be."

"I suppose you're offended by the teaching machines," she said. It sounded like the start of another well-worn monologue.

"No!" Kennerly snapped. "It's not the teaching machines. It's the kids. The only life I saw out there was a paper fight over the partitions."

"We do the best with what we have, Mr. Kennerly," said Adams, folding her hands on her desk.

"With what you have! You have more gadgets and hardware than—than AT&T."

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"Hardly. And I was not referring to the equipment in any case," she said quietly. "I was referring to the students."

That slowed Kennerly's charge. "What do you mean?"

"We have about forty-six percent of the school-age population. Which forty-six percent, do you think?"

"Ah—"

"I'll tell you, Mr. Kennerly. The forty-six percent that no one else wanted. The kids who were produced by accident or out of duty and whose parents haven't found a use for them since. Most of the handicapped. Most of the easily identified minorities. That's why you saw what you saw. And you can't lie to these kids. They know who they are, too. They know that their best chances for success are hustling and dependency. They know they're not the future leaders of government and business. And if any kid among them decides he's going to be the exception, he'd better be strong enough to take the others turning on him. But it wasn't like that, you say. What happened? Democracy. Freedom of choice. Tuition tax credits. In approximately that order. Everyone got what they wanted. The corpschool parents got a meritocracy. The private-school parents got cocoons to wrap around their children. These parents got a twelve-month babysitting service." With the actress banished and the person erumpent, Adams continued in a softer voice. "If you send your son here, we'll do our best by him. Our programs are excellent—if the child is up to them, if you can keep him caring. But realize he'll be surrounded by contrary models. I'm sorry—for you and for myself—but that's the way it is."

Kennerly squinted at the figure seated at the top of the stairs, blocking the path to his apartment. It proved to be Tom of Candice-and-Tom.

"Hi, buddy," said Tom, rising as Kennerly neared the top of the stairs. "I thought I'd drop by and find out why you're snubbing our party tomorrow."

Kennerly sighed, moving past and unlocking the door. "I'm not snubbing you. I'm just—we had other plans already. It was kind of short notice."

"That's not the way I heard it," said Tom, following Kennerly in and making a beeline for the liquor cabinet. "I heard you were all wound up over Martin being rejected by Elgar."

"So you had to make sure you had a chance to rub it in, right?" said Kennerly, disappearing behind the bathroom door.

"My, you *are* bristly, aren't you. It's just one rejection."

"Yeah, well. I thought I had a lock on it," Kennerly called over the sound of running water.

"No such thing as a sure thing," said Tom, settling on the couch with his drink.

"Thanks for that wisdom," said Kennerly, appearing at the doorway, wiping his hands on a towel.

"No charge. So what have you been looking at?"

Kennerly capsulized his last three days.

"Sounds like you've about run yourself out of options."

"I'm not ready to say that. I'll keep looking. Maybe we'll have to move. But

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somewhere there've still got to be some schools like the ones I knew."

"Oh, Dave buddy," said Tom, swirling the ice cubes in his glass. "Looks like I'm going to have to play Confrontation Therapist, because you don't seem to hear yourself. *You're* the cause of your problem! I don't know if you know what you want, but you've got so many things you *don't* want there isn't anything in the real world that'll please you. You've got to realize—kids are tough. They can handle imperfection. They can tell the sense from the nonsense. Be a little bit more realistic, and your problem's going to disappear."

"I think I am being realistic," Kennerly said softly.

"Jocko. That wonderful school you're remembering never existed. Sure, you survived it. But the kid next to you was dying of boredom. The girl behind you got pregnant on the team bus. Your best friend only cared about the sports. The teacher that lit your light chucked it all to sell insurance. You're in fantasyland, Dave. Wake up."

"Pretty easy to talk when your son got into IBM. He's set for life."

"But does he want to be, that's the question. How would you feel if your whole life had been planned by your father before he even knew your interests? The truth on that IBM thing is that Candy got the last word. I wish Chris was going somewhere else, and I don't think he'll last there. If he doesn't start to kick somewhere along the line, I'll disown him. Dave—you got your son a good job and a capital car. Those are his problems. If you're just walking and talking without making him crazy, you've done your part."

"Is that how you rationalize it?"

"Whoa," said Tom, holding his hands up, palms out. "Here's where I get off. It's not worth fighting over. I just hate to see you kick yourself for no reason."

"Right. Have a good party." It was an invitation to leave; his visitor hesitated, then took it.

Kennerly was still seething forty minutes later when Crystal returned, a sleepy Martin clinging to her neck. "Put him to bed," Kennerly ordered. "I need to talk to you."

"Talk to me or castigate me? I'll stand for one but not the other. I thought that, since you couldn't or wouldn't talk to me about it, maybe you could talk to Tom. I was wrong."

"You had no right to tell him. You should have minded your own business."

"I thought Martin *was* my business."

At that moment, Martin added a cranky wail to the conversation—the reedy cry of a tired three-year-old.

They were frozen that way a moment, a domestic tableau, her gaze defiant, his hard and unyielding. Then, mumbling "I gotta get out of here," Kennerly leaped to his feet, scooped up his keys, and fled the apartment.

He did not return that night, nor the next. When Monday came with no word from him, she called his office.

"He took five days' vacation," the group secretary told him, surprised. "Didn't you know?"

Crystal assured him that, yes, she knew, she had just gotten confused. And

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tried not to care about the rumors her call would inspire.

It was a week before they saw him again, pulling up in front of the apartment in a rented electricar. He took the steps three at a time, calling out their names. He did not merely admit himself to the apartment, he made an entrance, sweeping Martin up in his arms on sight.

"Hey Marty! Time to go see where you're going to spend the next few years. All right?"

To Kennerly's delight, Martin burbled, "School."

"Crystal—"

"Not interested. I need to tell you—"

"Talk on the way. Come on."

"Now? Martin needs to be getting to bed."

"So he'll sleep in the car."

"David—I've decided to terminate our contract."

Kennerly was unfazed. "That takes sixty days. In the meantime, grab what you'll need. You don't have to come with me, but you do have to come with him. Figure to be away a couple of days. The weekend."

"Go school now?" Martin demanded.

Kennerly ruffled the child's hair affectionately with his free hand. "Soon, Marty. Soon."

Kennerly drove south, into farm country, with Martin curled up on the small back seat. Kennerly himself seemed cheerfully oblivious to his wife's pronounced coolness toward him, denying her the chance to express her anger. Presently she lowered the seat back and turned away from him, withdrawing via sleep.

She was roused by the noise and movement accompanying a battery swap. While the mechanics swarmed over the back of the car, she ran a brush through her tousled hair. "We must be going quite a ways. What time is it?"

"Four A.M. We'll be leaving the highway soon, and I wanted to make sure we had a full charge."

An attendant appeared at the driver's window to return Kennerly's Cashcard.

"Do you want me to drive?" she asked. "You're not used to this, and I don't want to end up in a ditch or under a truck."

"I'm fine. I drove this twice last week alone."

She looked away, out her window, and said nothing until they were on the road again.

"Aren't you going to talk about this at all?" she demanded finally. "You take off without a word for a week and bounce back in like you went to the corner store. Where were you? What did you do? What is this place we're going? At least tell me *something* about it."

"I'm not going to talk about last week," he told her, "because apologies are too easy and don't mean anything. And I want you to arrive at our destination without any preconceptions. Go to sleep again. We'll be there in about six hours."

At twenty after ten the next morning, Kennerly slowed the car and turned off the two-lane country highway and onto a still narrower dirt driveway. As they crested a small hill, Kennerly stopped the car, and the cloud of dust they had kicked up briefly engulfed them.

"My God," Crystal exclaimed as the

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dismayed. "Is this it? It's a *cave*, for Christ's sake!"

Kennerly just laughed. "Not quite. Come on."

It was, in fact, an earth-sheltered home, burrowed into the side of a hill except for the long south-facing wall studded with doors and expanses of glass. An awning of solar panels ran the full length of the wall, and behind it grass grew on the roof.

Kennerly produced a key and let them in. They found themselves in a roomy but empty and carpetless chamber. "Living room or den," explained Kennerly. Martin was drawn to the cobblestone north wall—a strange and wonderful discovery for a child accustomed to bland plaster walls. The air in the house was pleasantly cool, and surprisingly dry.

"Doesn't anyone live here?"

"New owners haven't moved in yet. Come on—while he's busy." He nudged her toward a hallway, and led her into a room that opened off it.

"This is where I decided to put it," he said. "I've ordered one of the best smart terminals available—two phone lines, full data-base access, lots of on-site memory, voice capability. Plus the house is already wired for 400 video channels direct from the satellites. I've signed up for a phonics tutorial program from a company called Home Learning, and I'm looking at a super science program from Michigan State. There's a surprising amount of ed software available, CAI and books—there's a plan that will give a hundred books in Martin's area and replace half of them every two months. Real books—so he can curl up in a hammock out in the fresh air and read."

"You bought this house." It was almost an accusation.

"Yes."

"To quit your job and move here with Martin."

"No. That's the beautiful part. I'll keep my job—and do the same work. From here."

"Your own little cottage industry."

"In a way."

"Are there any neighbors? Kids his own age?"

"There's two families just a klick away if you cut through the fields. One has five kids, then there's a younger family with two. A nice healthy mix of ages."

She shook her head. "I never thought you'd run out and hide from the world."

"I thought you'd call it that."

"It is! Instead of trying to fix the things you don't like about the schools at home, you're giving up on them."

"Will you listen to why, or is your mind closed?"

"I'll listen."

"Thank you," he said, relieved. "First—I need to do something now, for Martin—not for *his* children. I can't start a campaign that even if successful won't show any results for five, ten or twenty years. I'd be making him a kind of burnt offering to my idealism.

"Second—think about what it'll be like for Martin. He won't be locked inside during the best part of the day. He won't be a slave to a schedule that ignores his individuality. He'll have the real world in his back yard *and* his books. He and I will spend more time together. He'll grow to see me as a com-

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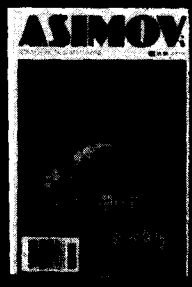
COME



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petent person, because he'll see me at work. He'll see work as a basic element in living. He won't see learning as something that only happens in a certain building on certain days with certain people. Still with me?"

"Still with you," said Crystal, a smile playing on her lips.

"Okay. Clincher. *This is what's coming*. I'm not the first, and more will follow. Big picture, now. Industrial revolution takes the wage-owner out of the family store, off the farm—away from his family. Technology. The knowledge explosion makes parents feel incompetent to teach their kids themselves—which they managed for most of human history—so they bundle them off to specialists and experts. Parents lose credibility. Family weakened. The crazy years. Looking back, hard to see a way around it. Parents didn't have the time or the expertise. But those excuses aren't any good any more—not now that microelectronics will let us and our kids come home."

"You've got it all wrapped up in a neat little package, haven't you?"

He shook his head. "There's a string dangling. You. Your contract."

"Oh—you won't need me now." She hesitated. "If you agree to the termination, we can avoid sixty days of awkwardness."

He stepped toward her. "I'll agree to the termination—on one condition. That we replace the contract with a vow." She stared at him. "I'm going to need you more than ever—now, and when Martin leaves, however many years from now. And I think I've been missing a lot, holding you at arm's length."

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I could have told you that," she said wryly. "I don't know, David. Are you sure you're not just trying to complete the happy little picture—momma, daddy, baby, and the little house on the prairie?"

"I'm sure," he said, taking her hands. She did not pull away.

"Hmm. I'll have to think it through." She pursed her lips. "But you do surprise me, David. There may be hope for you yet."

She stopped, cocked her head, and studied him. "Better show me where my studio will be," she said finally. "It sure isn't going to have a skylight, but it had better have a window."

Kennerly's happy yelp attracted Marin's attention, and he put his short legs to work tracking it down. But he was only confused when he found his parents kissing.

Epilog: The Garden of the Cognoscenti

After the critics have criticized, the analysts analyzed, and the historians historicized (sorry, Miss Plummer), what's left that is meaningful without being obvious? What are we to make of these exciting years? . . .

Where once hung a threat of federal domination, true local control has returned. Where diversity was once a punishable offense, it is now a rewardable virtue. Where students were once encouraged to reject their parents and their teachings, they are now provided a chance to embrace them. Where ivory towers once dominated the landscape, flowers of consumerism now rise from their rubble. Where teachers held sway as dictators, they are now servants. It is a *wonderful* time to be a parent or child. There now exists a veritable garden of educational delights, from which the connoisseur may assemble a tasty menu for the mind. As we enter the new millennium, we can be confident that our children are better off than ever before in our history.

—James Griveny

New York, May 17, 2002 ■

We're Fighting for Your Life

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Joseph H. Delaney

BRAINCHILD

New technologies create new situations—and new problems for one of the oldest professions.

Two days of rooting around in Delmar Schoonover's records by the now-frantic Ruth Purley had resulted in the formation of a precarious mound on his living room floor which threatened avalanche at any moment.

Dr. Schoonover watched pensively. Seated on a nearby ottoman, he'd long ago gnawed away his last consumable fingernail, and was reduced to simple fidgeting.

On the floor, sprawled out in a most unladylike manner, Ruth displayed her own frustration in regular bursts of muttering, as she slipped through yet another of the many notebooks. In her right hand a brand-new yellow pencil, already cracked, suddenly snapped, and she jumped to her unshod feet. A towering five foot three, she glared down at him, hands on hips, brown hair falling over hazel eyes, white blouse half fallen from the waist band of her severely slit black skirt. "Dummy!" she roared at him.

Schoonover's eyes fell. He looked crushed, his hands grinding into one another.

She dropped to her knees and placed her hands on his shoulders. "I'm sorry, Delmar. That was cruel of me. I take it all back. If you were a dummy you wouldn't be in the fix you're in, with all your own words about to bite you.

"But I'm frustrated. Worse yet, I'm sorely in need of some fresh cuss words. The ones I had are worn out."

"There's no need to apologize, Ruth. You're doing your best. Don't ruin your own career trying to save mine."

"It's not a question of that, Delmar. I'm your lawyer, remember, and lawyers thrive on controversy. None of this is going to do

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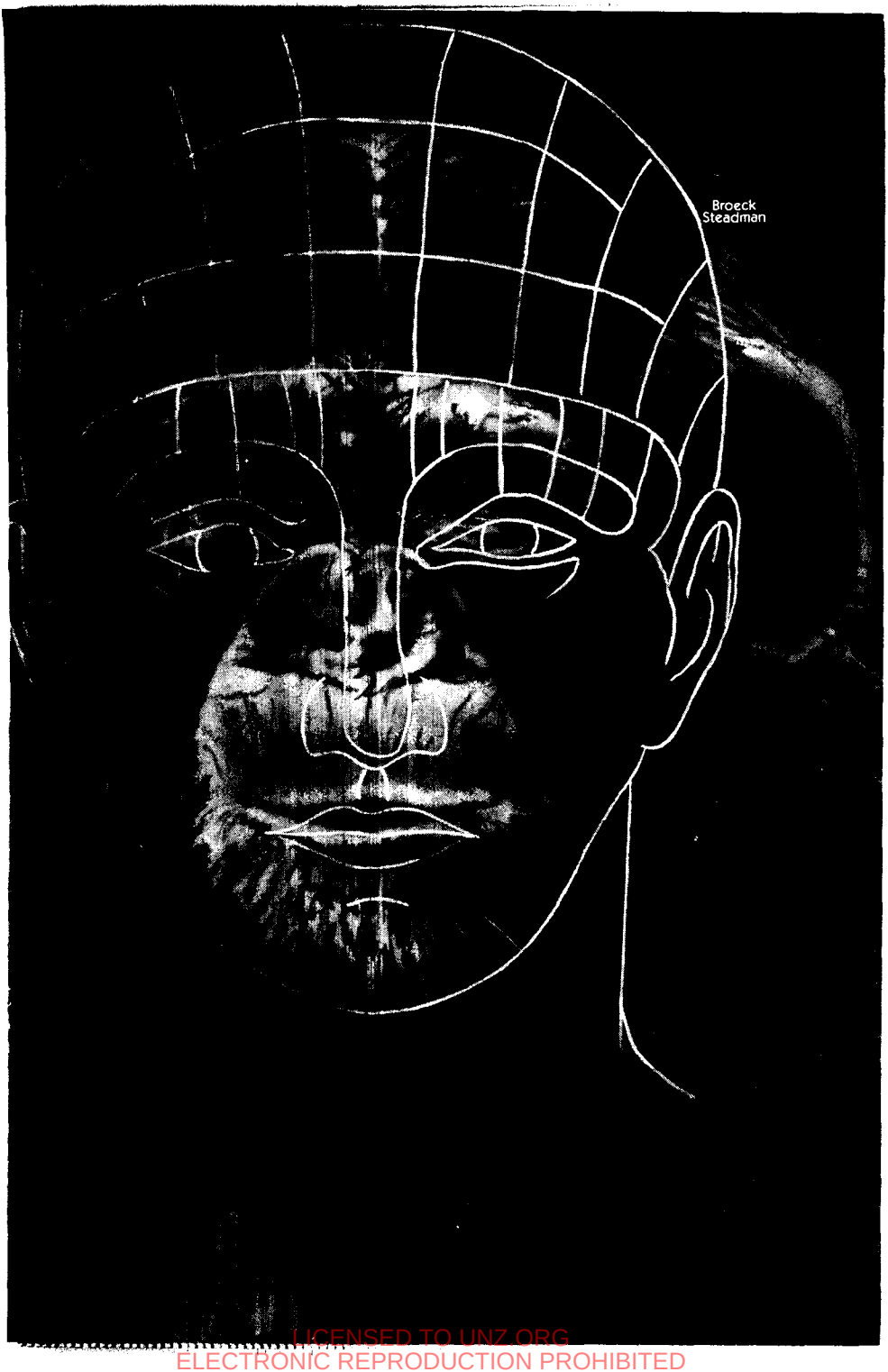

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me one bit of harm. Notoriety like this could make my reputation. Why do you think I've been working my buns off out here, instead of at the office? It's to keep the senior partners from taking you away from me." She grinned and rubbed his shoulders.

And that, she thought, had been true enough to start with. Now, it was different. He'd grown on her, big awkward baby that he was: helpless, bumbling, absent-minded, thoroughly lovable man. And she, Ruth Purley, modern, independent, liberated professional woman in the tradition of the old bra-burners, was falling in love with him. "Disgusting!"

"What did you say?"

Think quickly, Ruth! "I said it's disgusting. There has to be something basically wrong with a social system that can do a thing like this to you and to Adam. There has to be a way out of it. Everything I believe in depends on finding it. If I lose this case my faith in the system gets lost too. I think that's the part that really scares me."

"I'm satisfied with what you're doing, Ruth. And I'm grateful. You have no idea how scared I was when the F.B.I. grabbed me, and when they took Adam away. Just when I needed an angel, there you were, breathing fire on Marshal McGill. If you hadn't bailed me out I would've told them anything they wanted to know."

"There's nothing they need from you they haven't got already. Everything necessary to make the charge stick is right there in your published papers. 'Simon Legree Schoonover,' it says at the top."

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"Then why'd they try to get this?" He pointed to the jumbled pile of notebooks and loose papers.

"To gild the lily, Delmar, to gain publicity, sympathy, rabid followers; and to get Madelyn Hundin. That's what they're after. Here's an ignorant, big-mouthed boobody who probably never had an original thought, who makes her living raking muck and printing lies in that scandal sheet, and she's got enough influence in this country to get you indicted for slavery. You, Delmar Schoonover, M.D., Pioneer Genetic Engineer, Nobel Prize timber. She picks you to be her Big Tuna."

"I only met her once, Ruth. For about five minutes. Why is she doing this to me?"

"She's not after the Pulitzer Prize, Delmar. She wants the hide off your rump because, at the moment, that's a highly salable commodity. Right now it's selling papers that otherwise wouldn't be fit for outhouse use. Then there's T.V. appearances on the talk shows. Later, it'll be books. It'd be better for her if you lost, of course, but either way she'll make money. If you're acquitted she'll write an exposé on the crooked courts, you can book it."

Schoonover's mind didn't work that way. To make money, he thought, was a pretty poor reason to ruin a man and a worse reason yet to consciously impede the progress of science. He'd always looked on his research as a way to make an age-old dream come true: to make every child yet to be born healthy, happy and alert, to make every man and every woman as perfect as nature intended.

Now the dream was dying. Only Ruth believed it could be saved—or did she? Perhaps she, too, played out a part for reasons of her own, or maybe she intended simply to make the best of a bad situation and salvage what she could from the wreckage. Somehow, he doubted that, although it was possible that initially he'd represented only a professional challenge to her.

Ruth had forward ways, utterly alien to his personal concept of the feminine rôle. These, at first, had bothered him, until he found out she enjoyed their effect. Now he was at the point where he'd almost stopped blushing when she'd make an offbeat suggestion. If he could get his mind off his troubles long enough to let it happen, Schoonover thought, he just might be able to con her into seducing him. "Now there's a thought."

"O.K., so now we're both doing it, Delmar. Have you got an idea?"

"Yes, but on second thought, it's probably impractical. Forget it." He'd been vocalizing thoughts.

"Well, we have to think of something pretty soon. We've got jury selection tomorrow at ten, and probably no more than a week or two before a trial setting. I'd better get back to the pile."

"All rise," yelled the bailiff.

Schoonover jumped to his feet and breathed deeply, his lungs filling with the sweetly scented air. Ruth's perfume devastated him today, on this, the first day of his professional death. He reached down, found her hand, and grasped it firmly. Ruth, his small, ferocious champion, hair hanging down over the shoulders of her somber black suit, stood like an oak in a storm.

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Through the door behind the bench a tall, gray-haired man swept the skirts of his black robe around him, walked briskly to his chair, and sat down.

"Hear Ye, Hear Ye!" the clerk's voice boomed. "The United States District Court for the Southern District of Texas, now holding session in Corpus Christi, is open pursuant to adjournment. God save these United States and this Honorable Court."

"Heavy stuff, eh, Delmar?" Ruth whispered.

"Be seated," said the court.

Ruth looked around at the rest of the room. She'd seen movies of the old Scopes "monkey" trial of a couple of generations ago. History does repeat itself, she mused.

Admission was by ticket only, with serious-faced GSA guards on the doors, checking credentials carefully. Most spectators were media people, and they came from everywhere, as witness the variety of clothing and racial types. The front rows were reserved for artists, who now worked furiously to pencil figures on pre-prepared background scenes.

So here I am. Me, Ruth Purley, at center stage. And why not? Slavery prosecutions were news. There hadn't been one since U.S. vs. Booker, out in the fourth circuit, back in '81. That had been a relatively colorless affair. But Schoonover was no cotton farmer and Adam was no farmhand. No, this trial wouldn't be colorless.

She gazed to her left. Marshal Ralph McGill sat on a wooden chair, knees crossed, looking banal, twitching his right foot inside its fancy boot.

To her right was Roberto Monte, the Assistant U.S. District Attorney, relaxed, hand on a massive file, conversing in whispers with the Agent In Charge of the local F.B.I. office.

Then she looked up at the bench. Judge Cook was silently reading the minute sheet, determined to be certain that in this, the most controversial trial of his career, he made no errors obvious to the press. Around him, the various functionaries waited patiently: the minute clerk, who smiled demurely behind folded hands; and Paul, the reporter, surrounded by microphone wires that spread like spider legs from his recorder, hands resting on the keys of his stenotype.

Finally the court spoke. "The court will call cause number CR C-95 101, the United States of America vs Delmar Schoonover. What says the Government?"

Monte stood. "Ready, Your Honor." He resumed his seat, shuffling his file aside.

"Very well, what says the defendant?"

Ruth stood. "Subject to our motion to dismiss the indictment and our motion to suppress the defendant's statements, we're ready, Your Honor. If the court please, I'd like to be heard on those motions before we bring the jury in."

Monte jumped to his feet. "Your Honor, if it please the court, we've already been over the motion to dismiss, and the court has memoranda from both of us on the only issue raised, that is, whether the indictment has to allege that the victim of this crime was a human being. I think the law is pretty clear that this isn't required. As for the statements, there may come a time when the defendant can move to suppress for other reasons, but not on the basis of

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Miranda. The statements she's talking about were made prior to the arrest of the defendant. She's only entitled to suppress custodial statements which violate Miranda." He sat down.

"I'm inclined to agree with Mr. Monte, Miss Purley. So at this time I'm going to deny both motions. If, as Mr. Monte suggests, the occasion arises later and you wish to re-urge them, then the court will hear you. Now, are there any other motions before we bring the jury in?"

"The defendant would invoke the *Rule*, Your Honor," Ruth said, knowing that was one he couldn't deny.

"Very well. The rule has been invoked. Will all those persons who expect to testify come forward and be sworn?"

A number of people rose and passed through the gates toward the bench.

"Will counsel please approach the bench."

Ruth left Schoonover and there was a short conversation he couldn't hear. Then they left the courtroom with the marshal. Presently both she and Monte returned followed by a crowd of other people, among them Dr. Blatchley. There was a subdued buzz of whispered conversation. Schoonover peered into the crowd and saw why. In the center, dressed in a light blue cord suit, white shirt and shoes, was Adam's tiny figure. He held tightly to Dr. Blatchley's hand, looking around him through his thick-lensed glasses, his face a stern mask until he saw Schoonover. His free hand went up in a wave and tears appeared in his eyes. Schoonover knew that without Blatchley's firm grip Adam would [illegible] crying in terror. That mustn't happen, he told himself. Ruth wouldn't like it.

"What is this all about, Ruth?"

"I invoked the rule. That means the judge has to swear all the witnesses who were in the courtroom or might enter, admonish them against talking to one another about the case and exclude them from the courtroom until they've been dismissed by both sides. It's supposed to keep them from coordinating their stories; as a practical matter both sides do that before we ever get here. I did it for show. It gives the reporters something to say."

"Does that mean I have to leave?"

"No, you're a party. You can't be excluded. And the other side gets one person of their choice to assist. That'll be the A.I.C. It always is."

"What about Adam? Is he going to testify?"

"I don't know. I haven't made up my mind about that. And I don't know if the court would permit it."

Monte had started his opening statement. ". . . expects the evidence to show that this man, Dr. Delmar Schoonover, seated at the table next to Miss Purley, has, by meddling with nature, brought intelligence to a creature that didn't have it before, and having done that, proceeded to enslave him, or it, as you choose, to deprive it of the civil rights the Constitution requires be given any intelligent creature . . ."

Ruth was on her feet at once with an objection. "That's a misquote, Your Honor, and it constitutes unfair comment calculated to mislead and prejudice the jury. We move for a mistrial."

Monte had turned to listen. "I believe the statute uses the word *person*, Your

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Honor, but the average man, and this jury panel, understands that it's a distinction without a difference."

"I'll sustain the objection, counsel, but your motion for mistrial is denied. The jury will disregard Mr. Monte's remarks and be instructed that constitutional protections apply to persons. You may proceed, Mr. Monte."

"Thank you, Your Honor," Monte said, making it sound as though he were accepting an apology from the judge. "We will introduce evidence to show that the creature known as Adam is, in fact, a person within the meaning of the 13th Amendment of the Constitution of the United States; that he has been forced to labor against his will, as the indictment charges, restrained in his liberty, deprived of his freedom of choice to stay or to go.

"I'll go further than that; I'll suggest to you what the defendant may and, I believe, will attempt to prove. I expect he will challenge the humanity of the creature he brought into this world, to attempt to convince the twelve of you that Adam is an animal not protected as you and I are. I can only urge you to listen carefully to the evidence you see and the testimony you hear and decide for yourself what it is he made. Thank you for your attention."

The judge looked at Ruth: "Miss Purley?"

"If it please the court, the defendant would ask leave to reserve the opening statement until the Government has finished its case in chief."

"Any objection, Mr. Monte?"

"None, Your Honor."

"Very well, so ordered. Call your first witness, Mr. Monte."

"Your Honor," Monte asked, "May counsel approach the bench?"

"Come forward, please."

When the two of them reached the bench, Monte said, "The Government plans to call Dr. Blatchley as its first witness, Your Honor, and although we have no present intention to indict him, his testimony may result in the discovery of criminal activity on his part which would require me to go to the Grand Jury. So I'm suggesting to the court that we send the jury out while he's being admonished. Also, Your Honor, we anticipate Dr. Blatchley will be a hostile witness, in that his sympathies and prejudices are with the defendant, and I'd ask the court to rule him hostile."

"Miss Purley?"

"Well, Your Honor, I've explained Dr. Blatchley's immunities to him, and he's prepared to accept the risk and testify. I'd planned to call him later if the prosecution didn't, but I will object to ruling him hostile at this point; there's been no proof he is."

"I agree with her, Mr. Monte. I'll rule on your motion and deny it for the time being, until Dr. Blatchley's testimony demonstrates his hostility, if it ever does. And I'll get the standard admonition in the record while the jury's out." They nodded and resumed their seats.

"Ladies and Gentlemen of the jury, the court's going to take up some preliminary matters for a few minutes. Meanwhile, I'll ask you all to go with the marshal and be back here at 10:30. You'll be permitted to leave the building but you must not discuss this case with anyone, not even with one another."

McGill rose and the jurors followed

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him out of the courtroom. Schoonover was perplexed and felt left out of things.

Ruth explained. "I know it looks like a lot of foolishness to you now, but it all has a reason. We've scored a couple of points already, whether you know it or not."

"I must have missed them, Ruth. It looks to me as if they're ready to hang me already and they don't even know what it's all about. Mr. Monte's already got them worked up by telling them I don't think Adam's human. Why didn't you do something?"

"That's one of the points we scored. You'll see. It's called a rabbit trail. And don't worry about the jury. Juries are wishy-washy. Their minds flap back and forth like tumbleweeds. You're only in trouble when the wind stops blowing, and it isn't going to. Ah, there's Dr. Blatchley."

"What's he doing here? I thought he was our witness."

"He is, but Bob has a right to call him, too, and since he gets to put his case on first he has that advantage over us, if it is an advantage. Blatchley's programmed, you know that. I worked most of yesterday on him. All this really means is that in effect the cross examination comes first, then the direct."

"Ruthie, I hope you don't mind all these questions. It's just that I don't . . . I never was that interested in law before. I don't understand all this cross and direct stuff."

It's simple, Delmar. Direct is questioning by the party who calls a witness. He vouches for the witness's testimony. He's bound by it. The other side attacks the witness's credibility by cross questions. The answers don't bind him, ordinarily. He starts out with the presumption the witness is a liar. Unless he adopts the witness as his own we can't comment to the jury about unfavorable answers. That's why lawyers sometimes don't object when the other side exceeds the scope of direct examination; sometimes, if you know in advance what the answer will be, you can let it go and then claim the other side adopted the witness. Understand?"

"No. Why'd the jury leave?"

"The judge is going to make sure Dr. Blatchley understands his Fifth Amendment rights before he testifies. That's another piece of showmanship on Monte's part. He knew the judge would deny his motion to rule Blatchley hostile, so he'll try to rattle him by suggesting he could face prosecution later."

"But Dr. Blatchley *is* hostile. At least, he'd better be."

"Of course he is, in layman's terms. But not legally; not until he demonstrates such obvious prejudice against the prosecution that it's unfair to require them to vouch for his testimony. What Monte really wants is the right to lead him and then impeach him. If he gets a hostile-witness ruling from the court, then he can. You can lead and impeach on cross. You can't on direct."

"Oh," said Schoonover. "I see." But he didn't really.

The admonitions didn't take long. Blatchley was a positive, matter-of-fact man who lost no time in convincing the judge he fully understood the risk and was willing to take it. Ruth had already decided he'd make a superb witness. He had just the right amount of age to be robustly grandfatherly. The fringe of

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gray hair around his bald pate, together with his gold-rimmed bifocals, framed an honest, open face. He had a tendency to cock his head in a manner suggesting righteousness, although this was only the result of trying to look through the proper part of the lenses. Moreover, he was possessed of a melodious voice and a superlative command of the English language. Monte would discover he was slightly a tiger.

Seated in the chair with his hands together, joined at the fingertips, the old man waited patiently for Monte's first question.

"Tell the jury who you are and what you do, Doctor."

Blatchley cleared his throat. "My name is Clarence Blatchley. I am the founder and current director of the Blatchley Institute of Genetic Research."

"How long have you done this?"

"Since it opened, twelve years ago."

"How many people work there?"

"Do you mean everybody or just the technical people?"

"Technical people, Dr. Blatchley. Those who actually do any scientific work."

"Well, let's see. Besides myself and Dr. Schoonover, there's Dr. Smith and Dr. Fleming; Dr. Smith's a botanist, Fleming's an entomologist. Then there's Roy Leeper, a bacteriologist, and Harry Shabelman, a pharmacist. Then we have a bunch of maintenance people, animal handlers and so on."

"Tell me: Who was involved in Adam's development?"

"That was Delmar—I mean, Dr. Schoonover's project. He worked on it pretty much alone. He had some technical assistance from the rest of the staff, of course, and we had some outside specialists in on it too. I could check the records."

"Later, perhaps. Were you involved in this research in any way?"

"I'm involved in everything that happens at the institute. I supervise all the projects, and I have to approve them to start with."

"Did you approve the project that generated Adam?"

"I did."

"How long ago was that?"

"Oh, let's see. Adam's six. It must have been eight or ten years ago. I really don't remember."

"And that was Dr. Schoonover's brainchild?"

Ruth flinched. The question was leading as well as being a characterization, but she decided to let it pass. Objections have more punch if used sparingly and she might be able to utilize the term herself, later.

"It was his idea, if that's what you mean."

"Yes, Doctor, that's what I mean. Now, you would never have approved a project that didn't have a commercial object?"

"That would depend on the project. Naturally we try to select things that produce revenue, because that's what supports our research. But that's not the only criterion . . ."

"Let me stop you there, Doctor. Please just answer the questions simply."

"I was about to say . . ."

"Doctor, please!"

Blatchley settled back. Ruth had warned him about this tactic. It was

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designed to get a witness rattled; to trap him into simple answers that sounded wrong.

"Let's go on, Doctor; you said Dr. Schoonover started the project eight or ten years ago, with your approval. What was the object of the research?"

"Dr. Schoonover was working on congenital birth defects, specifically, neurological defects—the kind responsible for mental retardation with hereditary causes. He was attempting to find genetic methods of eliminating them."

"Do you know how he intended to do this?"

"Yes."

"Will you explain it to me?"

"Yes, I can explain it. The question is whether you will understand it. I don't know how good your scientific education is."

Bitch, Ruth thought. The old man was following the game plan.

Mundo started stonewalling. "Well, Doctor, just explain it to me as you would any average, run-of-the-mill high school student with average intelligence who took the average subjects and got the average grades."

"That's a tall order, but I'll try. To begin with, you have to understand that life doesn't just grow, like Topsy. Any organism follows plans. The plans differ slightly even in individuals of the same species. Differences increase as relationships between species grow more remote. We call the plan the genetic code. The name's derived from the primary unit, the gene. Genetic alignment changes slightly from generation to generation and forms combinations that are almost endless in variety. Statistically, it's a fairly predictable system; individually it's highly unpredictable." He looked the D.A. squarely in the eye. "O.K. so far?"

"Yes, go on, Doctor."

"Natural forces affect genes; therefore they also affect heredity, which is the key to evolutionary process. Back to that in a moment, but first let me say that man also affects evolution by what he does, and has since time began. For instance, causing a species to prosper by domesticating it, or causing its extinction by hunting it or overrunning its habitat. Man has been responsible for most of the changes in animal evolution in modern geologic times.

"He also learned to select stock for breeding or for planting, and he understood the results this produced even if he didn't know why. It was pretty much a cut-and-try affair until Mendel explained it in statistical terms a couple of centuries ago.

"Genetic changes can produce beneficial results, but they can also produce the other kind. Effects such as Huntington's Disease, the sickle cell trait or Tay-Sachs; all systemic diseases of genetic origin. Their incidence among the population conforms with the known laws of genetics. Statistically, they're insignificant when you consider humanity as a whole. They're not communicable except through the reproductive process, and then only to offspring with the right ancestry.

"Genetics affects communicable disease organisms, too, and its victims. This is where genetic engineering really started. Because of the built-in plan of the genetic code, certain organisms became genetically acceptable hosts for genetically compatible parasites. As a

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result certain classes of microorganisms could make certain other classes of life sick.

"Here again was an opportunity to use the selective process to cure the illness; to identify and isolate the organism, grow it and find out what killed it; to change the host body at the cellular level and cause it to produce defensive mechanisms it wasn't born with. The process was crude, hit or miss. Statistically, however, it was completely valid and as a result there aren't many communicable diseases we can't cure or prevent. Some organisms, such as gonococci and flu virus, fight back with their own mutations, but by and large it still works."

"This is all very interesting, Dr. Blatchley. But I'd like to get down to basics . . ."

"We are down to basics, young man—*basic* basics. I'm talking down to you already. I thought you wanted to understand this process."

There were snickers from the spectators, some even from the jury. There wasn't a face in the courtroom without a smile, except Monte's.

"Well, Dr. Blatchley— What I'd like you to tell the court is how all of this relates to the production of the creature who is the subject of this prosecution."

"I told you I'd get back to the question of heredity, didn't I?"

"Yes, you did, Dr. Blatchley. Would you please do so?"

"O.K., heredity means that the offspring of any parents share the characteristics of each, whether these are observable in one or the other adult or not. Some characteristics are called dominant; they appear in the offspring and one or both parents simultaneously. The recessives don't. They appear only in the offspring and result from the combination of two or more genes not dominant in either parent but dominant in combination. It's like adding two small numbers together to make one big number.

"Mutations are seldom dominant, but they occasionally combine in their effects with recessive genes and produce a new characteristic. Sometimes the new characteristic is beneficial, sometimes it's harmful, and on most other occasions they're simply harmless.

"Dr. Schoonover was working on harmful effects—the results of past mutations to the gene plasm that either alone or in combination produced what the public used to call feebleminded-ness.

"Now, there are four common sources of mutations. First, there's radiation, natural or manmade. There's no way to eliminate all of it because it comes in from outer space and out of the earth. We have to live with it. Another source is other organisms, such as viruses, which enter the reproductive cells and change them. It's not as important as radiation, but it is there. The third, biggest, present cause is chemical. Modern man brings that on himself and it's going to get worse.

"These three are natural causes. However, there's also a fourth, artificial cause: manipulation, what we've started calling genetic engineering. Man now has the capability to tear down and rebuild individual genes; to rearrange their constituent fractions in new configurations to do different things than nature intended; to add and remove things from

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them. In other words, to selectively change the genetic plans and control evolution.

That was Dr. Schoonover's objective." He paused.

"Go on, Dr. Blatchley. Explain what he did."

"He was seeking ways to detect and either alter or eliminate damaged areas of genetic coding. This is not easy. There are thousands, perhaps millions of variables, all affecting one another. It takes time and hard work to find out which gene or genes are responsible for any given characteristic, and longer still to ascertain the fractions within it which give it the power to do what it does. Then the mechanical, or chemical, process makes a complete, and the result is, hopefully, a gene that will do what we wish it to do."

He looked at Monte, who simply motioned him on. Then he continued.

"As you see, the process is a long one. It means taking one step at a time up the evolutionary ladder until we finally get to man. The usual starting point is microorganisms, because of their rapid propagation; then sometimes insects, for the same reason; and then on to lower orders of better-organized life forms, until we get to rats, guinea pigs and rabbits, the generations are fairly short and results come fast. But the trouble with working with the lower forms is their remoteness from the human race, which causes the results to be almost only in generalities. You have to get much closer before you can work on human subjects. Fortunately, man has relatives in this world, beginning with monkeys of the very remote past and moving with the great apes, who split off the hominid line relatively recently. The closer the relationship, the more identity there is in the genetic code and the more similarity there is in physiological behavior. This makes them extremely useful as experimental animals. They're subject to many of the same diseases that men are, because their nearness to humanity makes them compatible with the disease-producing organism, too.

"But more important, their skeletal and neurological systems vary least from man's and in many respects the genetic information is substantially the same as man's. That's why Dr. Schoonover used apes, specifically chimpanzees, in his experiments."

"Was Adam the only altered ape?"

"No. There were six."

"What happened to the others?"

"Well, early in the experiment the technique was relatively crude. There were failures."

"What sort of failures were there, Doctor?"

"Basically they were physically or mentally defective, or both, to the extent that they needed life-supporting devices. There was a set of Siamese twins joined at the neck, for instance. Gradually, however, we learned what we set out to learn and the results got better."

"Were these animals destroyed in the experiment?"

"Yes."

"All of them?"

"All except Adam."

"For what purpose, Doctor?"

"So that the bodies, particularly the brain, could be examined in detail."

"It was the brain development that primarily concerned you?"

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"Yes."

"Any particular part of the brain?"

"Yes, the frontal area."

"Why?"

"This is the part of the brain where conceptual thought takes place, anyway in human beings."

"Don't animals think, Dr. Blatchley?"

"Yes, but not the same as you and I. In the case of the apes the threshold of reason is relatively near, but they haven't crossed it."

"Not even Adam, Dr. Blatchley?"

"Adam's a special case. There has never been anything like him before."

"Are you saying you do not know?"

"Yes. Someday we may know but we don't yet have enough information to measure his full capabilities. He's too young."

"Well, Doctor, Adam's six, I believe. Is that right?"

"That's his chronological age, but he's still a child. Normal chimps don't mature until eight or nine. We don't know what the alterations have done to Adam's metabolism or how they'll affect his life span. That's one of the things we're trying to find out."

"And is that why he hasn't been killed and studied like the others?"

Blatchley was ready for this. Ruth had anticipated it and warned him to expect it. The turning point of his testimony had been reached. From now on he could expect Monte to get mean. He answered carefully.

"As I said, Adam's a special case. No, we never considered killing him. He's the proof of the experiment's success. We should learn enough by observing him to confirm Dr. Schoonover's findings."

"O.K. Let's talk about your observations. Do you take an active part in the experiments with Adam?"

"Yes, I do."

"Does he, in your opinion, and based on your observation, differ from his parents?"

"Yes."

"How is he different?"

"Well, to begin with, he doesn't have a pelt. He isn't hairy except on his head, like a man."

"What else, Doctor?"

"The foramen magnum is farther forward, so his head has a better balance than a chimp's, and his pelvic girdle is different, too. His legs are set back farther. He walks more erect than a chimp, but still not like a man. He doesn't have the S-curve."

"What is the S-curve?"

"It's a pair of curves in the spinal column, one concave, the other convex, which cancel each other out. Only human beings have it. If we didn't, we'd all walk slightly stooped."

"Go on, Doctor. What other differences are there?"

"Those are the big ones. Aside from that I can't think of any that are really that remarkable. He still has the prehensile feet, for instance, with the opposible great toes. Possibly his face is a little less prognathous—snoutlike—and he doesn't seem to have the massive brow ridges the others have. We don't know how long that will last, though, since he's far from mature, and this is a characteristic of the adult chimp."

"So these are the physical dissimilarities, right?"

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Yes.

"Would you not agree that although the apes might represent dissimilarities between Adam and the apes, they appear to also represent similarities between Adam and a human being, such as you and I?"

"Well, they do give him a resemblance to me. I can't tell about myself, but you, I guess he does look something like you." He patted his bald head.

There was laughter. Even the judge had to hide a snicker. Ruth looked at the jury, hoping they wouldn't characterize Blatchley as a wise guy because of this. But they appeared to be staying awake and enjoying the entertainment. Blatchley's face retained its open, friendly look, and that touch of the angelic some older men have. He waited patiently for Monte's next question and Monte was striving mightily to maintain composure.

"Tell us about neoteny, Doctor."

Smart, thought Ruth. *Monte's been hitting the books, or else he's got his own expert socked away somewhere, priming him.* She herself had only heard the term a couple of days ago.

"Neoteny is a term we use to describe arrested fetal development," Blatchley answered.

"How is it significant to the subject of Dr. Schoonover's work?"

"The presence of the effect in Adam was confirmation that Dr. Schoonover was on the right track with his experiment."

"Does the effect have physical characteristics?"

"Yes, several."

"What are they?"

"I would say that the most notable is the lack of body hair, which I already mentioned. Then there's a prolonged infancy, delayed sexual development, and generally a longer life span with dramatically increased intelligence. That's what we expect, anyhow."

"Isn't it a fact, Dr. Blatchley, that this effect is best known as a human characteristic?"

"Yes, it is."

"Would you explain to the jury what that means?"

Blatchley cleared his throat and turned slightly to his left. "Well, I'll try. The arrested fetal development I just mentioned prevents man from going into the last stage of his biological physical development. He stops just before that happens, and you might say that birth, whenever it occurs, is premature. He is unfinished. He emerges unprepared for life on his own, has a protracted and helpless infancy, a long childhood, and physiologically speaking, a lifelong adolescence. Somehow, this is related to intelligence. We don't know all the reasons, but we believe it involves not only the increased capacity for cranial growth, but also the effect of sensory data upon the developing individual. My knowledge in that area is rather limited. I'm not an expert."

"You are an expert in the sense that you are a doctor, and by virtue of your experience with the field, are you not?"

"There seems to be some misunderstanding about that part of it. I have done some work in the field of genetics, but I'm not an M.D. I thought you knew that."

"I had assumed that's what the 'Doctor' meant. What is your specialty?"

"I'm a Doctor of Dental Surgery. I

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got involved in genetic studies trying to grow teeth—with some success, I might add."

Apparently Monte hadn't done his homework. Almost everybody over fifty had benefited from Blatchley's work in that area. You didn't get dentures anymore; you got an implant. Several of the older jurors were smiling and, hopefully, now looking on Monte as fallible. There was one old geezer in the front row of the box who sported a fine smile through brand-new choppers he hadn't been born with.

Ruth whispered to Schoonover, "Monte's in trouble. That's good for us."

"How can you tell?"

"I can tell. Professional secret. The ears never lie. Shh!"

Monte plodded on. "Going back to Adam, Dr. Blatchley; you said that the neoteny effect was apparent in him?"

"Yes, Adam was different in appearance from the time of his birth. So much so, in fact, that his mother rejected him."

"You mean she didn't want him?"

"She seemed afraid of him. She didn't know what to do with him."

"She was a chimp, of course."

"Yes."

"What did you do about this?"

"I myself did nothing." He gave Monte that look the British used to call "Dumb Insolence."

"No. No, Doctor. I'm speaking of the staff collectively. What did they do?"

"Adam was removed from her and raised on the bottle. That's relatively common with laboratory animals anyway. The nature of their environment makes adjustment difficult."

"Did you have an opportunity to observe how the staff treated him?"

"Yes. I was around a lot during normal working hours."

"Isn't it true that Adam got pretty much the same treatment a human baby would get?"

"He got the same treatment any infant would get from my people."

"Nothing special?"

"Not unless you count the clothes. Adam needed those. He didn't have any fur. Remember?"

"What about later, after he was a year or two old. Wasn't he provided with toys?"

"Certainly. Any animal can enjoy toys if they're suited to its needs. Puppies and kittens, for instance. They play."

"But they don't watch TV, do they, Doctor? You don't give them Tinkertoys, or modeling clay, or things like that?"

"Like I said, we give them what is suitable. In Adam's case we had to find out what that was. Also, we hoped to be able to measure his intelligence that way."

"Were you successful in doing this?"

"Yes, but the results are incomplete."

"You're still working on that?"

"Yes, of course. It's a long-term experiment."

"Adam talks, doesn't he, Dr. Blatchley?"

"Yes, after a fashion, but he wasn't born with the ability."

"You mean he wasn't smart enough?"

"No, that has nothing to do with it.

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He didn't have the physical capability. None of the apes do."

How is it that Adam can talk now?"

Adam's mouth and throat were still apelike when he was born. The—uh, what we call the dental arcade was elliptical, as opposed to semicircular as in the human being. The jaw was built for biting and the muscles in it were there to provide power, not control. He had to be surgically altered to achieve that."

Is he understandable?"

Yes, provided you're patient. You have to listen carefully and it helps if you're used to him."

You can understand him, can't you, Doctor?"

Yes."

Could I?"

If you did as I just suggested."

Is it possible to hold a conversation with him?"

Yes, provided you keep it simple."

As a result of these conversations, have you been able to form a judgment as to Adam's intelligence?"

Yes."

What is that judgment, Dr. Blatchley?"

Adam has intelligence."

You've said that. How intelligent is he?"

I don't know. There's no way to tell until he gets older."

Not even now?"

Not even now. You have to understand that chimpanzees mature at rates differ vastly. The normal chimpanzee infant's vastly superior to the human baby, in terms of what he can do for the first eighteen months. That's the result of faster development. But around the thirtieth month they're still roughly equal, but the chimp loses ground rapidly after that. With Adam, that stage had been somewhat delayed. We don't know for how long."

"O.K., can you tell me this: What's his intelligence level compared to that of a human six-year-old?"

Ruth had had enough. She rose and objected. "He's asking for a conclusion, Your Honor."

"Sustained."

"But Your Honor," Monte protested, "Dr. Blatchley's an expert. He's entitled to give an opinion on that basis alone."

"The objection's been sustained," said Cook. "I didn't hear the proper predicate being laid."

There were two things Monte could do now. He could pursue his present line, qualify Blatchley as an expert and risk getting identified with him, then ask his question hypothetically, or he could go on to something else. He chose the latter.

"Does Adam know he's different?"

"Objection, calls for speculation," Ruth fairly roared.

"Sustained," the judge roared back.

Monte shrugged and went on. "You've had conversations with Adam?"

Blatchley nodded.

"You'll have to give an audible response, Doctor, so the reporter can take it down."

"Yes."

"Did the subject of Adam's origin ever come up?"

"Yes."

"Where does he think he came from?"

Ruth jumped to her feet. "I'll object to that, Your Honor. His answer would

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have to be hearsay. Also, again, it calls for speculation. And even if it were an otherwise proper question, it's too broad."

"Sustained."

Monte tried chasing salvos. "Well, now, Doctor, Adam knows he's not a human being, doesn't he?"

"Objection. The question is argumentative, calls for a conclusion, is leading and assumes facts not in evidence."

"Sustained, Miss Purley." The judge's voice had assumed a monotonous tone. "Mr. Monte, you'll confine yourself to proper examination."

"Your Honor, may we approach the bench?" Monte had had enough of this.

"Come forward, counsel."

Ruth joined him. "Your Honor," Monte said, "I'll again move to rule the witness hostile. I think that's been demonstrated over and over again."

"I don't," said the judge. "The only hostility I see is on your part. It's up to you to protect yourself, counsel. Just ask the proper questions and she'll have no standing to object. Your motion's denied."

Monte went back to his seat, leaving the crowd to wonder what this had been about.

Ruth tried to keep such things at a minimum, believing that it alienated juries to feel they were left out of things. So far, she was satisfied with Blatchley's testimony, though there were perils ahead and it promised to be grueling and lengthy. She knew what the prosecution was after, of course, and pretty much what her opponent would do next. In Monte's place, having taken a lump or two, she'd try to turn the witness around and make him the heavy. He was a good enough lawyer to do that; he just didn't have the range yet. But he'd get it—possibly fairly soon, from the sound of the next question.

"Dr. Blatchley, could you tell the jury how Adam generally occupies his time?"

"Now or earlier, Mr. Monte?"

"Now, Dr. Blatchley."

"I don't know. I haven't seen him for several weeks."

Cut that out, Doc, Ruth whispered to herself. *Don't try to get cute. You're outclassed.*

Monte took off his glasses and faced the witness. "Doctor, I'm talking about the period when you last saw him."

"Well, O.K. That would have been the 12th of last month, or thereabouts, when he was arrested . . ."

"Without comments, Doctor, please just answer the question and tell us generally what he usually did."

Blatchley looked over toward the judge, met a stern gaze, then faced Monte. "Well, he always got up early; generally took a shower. He liked water. Most chimps don't. Then he'd eat breakfast, usually cereal and fruit, and watch a little TV, cartoons and things. We had a program for him. Sort of a tutor system, to see if we could teach him to read and do simple arithmetic. Later, if the weather was nice we'd have playtime outside. Adam liked to feed the chickens and pet the goats."

"Did he do any other work besides feeding the chickens?"

"Work? Well, we thought of it as training; part of the experiment to test his limits. Yes, he did other things."

"What other things did he do?"

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Oh, he'd help out whenever anybody asked. He could sweep, dust. That sort of thing. Wash windows. Adam's a really good climber."

"Did he have to clean the animal cages?"

"No, he never did that. We had maintenance people and animal handlers for that. Sometimes he'd play with the rabbits and guinea pigs."

"You said people would ask him to help."

"Yes, we always tried to make him feel important, to make him think he belonged. Having something to do gave him a part to play and helped him to feel at home."

"But he was born there. Why shouldn't he feel at home?"

"He was the only chil— the only one of his kind on the place."

"Did you start to say child, Doctor?"

"Perhaps. It's natural to think of him that way even though he really isn't."

"Weren't there other young chimpanzees at the institute, Dr. Blatchley?"

"There aren't any now. We've had them there in the past."

"Did you get rid of them because of Adam?"

"No, of course not. They're simply not required for current experiment."

"Did Adam ever see another chimp?"

"Once or twice."

"How did he react to his encounter? If you know."

"It appeared to me that he considered them the same as any other animal. It didn't seem to bother him. Of course, we never let him get close enough to touch one."

"Why not, Dr. Blatchley?"

"Because apes can be like people in some ways. They sometimes react with hostility toward things that are different."

"Has Adam ever asked you about his parentage?"

"No."

"As far as you can tell, does he know he has any parents?"

"He knows."

"Has he ever asked where they are?"

"If he has asked anyone, it wasn't me."

"Has he ever met a human child?"

"Not that I know of."

"He's seen human children on TV, hasn't he?"

"I presume he has."

"And he's never asked why he hasn't met any?"

"He has not asked me."

"Dr. Blatchley, are you acquainted with a woman named Madelyn Hundin?"

"I think so. Is she that reporter?"

"Yes. You know who she is, then?"

"Yes, I know."

"Did she ever visit the institute?"

"Yes, she was there earlier this year, about January, I think."

"Why did she come?"

"She had read some of Dr. Schoonover's papers and wanted to see Adam."

"Did you allow this?"

"Well, I tried to discourage her at first. I was afraid Adam would be upset, meeting a stranger, but she wouldn't leave. Finally, I agreed to give her a guided tour, provided she didn't disturb him."

"You didn't know she was coming?"

"No, she didn't call or anything. Just dropped in."

"Where did you take her?"

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"We went outside first so she could take some pictures. Then we went in the greenhouse to look at Dr. Smith's experiments. She wasn't much interested in them and we didn't stay long."

"Where did you go after that?"

"To Dr. Schoonover's lab."

"Was he there?"

"Yes."

"How about Adam? Was he there, too?"

"Yes."

"What was he doing?"

"He was helping Dr. Schoonover in the clean room."

"Doing what?"

"Replacing filters in the ducts. We have to do that every day or two."

"Tell us how he does that, Doctor."

"Well, Adam operates a little differently than a man would. He doesn't use a ladder."

"Exactly what does he do?"

"He usually climbs up a pipe until he gets to the ductwork and then walks it to the nearest grille. He opens that, goes inside, and gets the filters out. Then he drops them to whoever's on the ground and catches replacements that are thrown up to him. When he's finished he comes back the way he went up."

"How high off the floor are these ducts?"

"About twenty feet."

"What safety precautions are taken when Adam does this?"

"Why, none that I know of, but Adam's got two million years . . ."

"Just answer the question, Doctor, please," Monte interrupted.

"But—"

"I haven't asked a question, Doctor."

Blatchley settled back, noting the stern look on Ruth's face.

"Where was Adam when you and Miss Hundin entered the clean room?"

"He was inside the ducts putting in the filters. He came out a little while after we got there."

"You testified earlier that Miss Hundin took pictures outside."

"Yes."

"Did she take any in the clean room?"

"Yes, I think so. She had one of those fancy cameras with the motor in it."

Monte opened his file, took out an envelope and walked over to Paul, the reporter, who attached stickers.

"May I approach the witness, Your Honor?"

Cook assented.

"Dr. Blatchley. I'm handing you what have been marked as Government Exhibits 1 through 11, and ask that you examine each of them."

Blatchley took them and looked them over. No doubt about it; these were the pictures she'd taken, and the angle had been calculated to make it look like Adam was in danger of falling. In a few moments Monte asked, "Can you identify the scenes depicted by these exhibits, Doctor?"

"Yes. These are the photographs Mrs. Hundin took when she and I were in the clean room."

Monte took the pictures to the defense table and handed them to Ruth. She gave them a cursory glance and handed them back. Naturally, she'd seen them before. In fact, she had prints. Modern discovery methods had long ago taken

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the surprises out of law. She knew there was no way to stop Monte from getting them in and stipulated to their admission.

Monte went in for the kill. "Dr. Blatchley, you testified earlier that you are the founder and director of the institute."

"That is what I said."

"In this capacity do you control the finances?"

"Yes."

"Do you sign the payroll?"

"Sometimes I do. Usually the bookkeeper does it."

"Can you recall ever signing Adam's paycheck?"

"Adam doesn't get a paycheck. He's not an employee."

"But Adam does work, doesn't he."

"If you want to call it that. He helps out, does chores on a more or less regular basis. It's part of his training."

"What if he were to refuse to do something?"

"I don't know that this has ever happened."

"Would you permit it to happen?"

"I don't know. If it was an essential part of his training or an experiment we might insist."

"How would you enforce your order? Would you punish Adam?"

Ruth considered objecting. The grounds existed. The question was compound, leading, argumentative, and speculative. She decided against it. Too easy for Monte to rephrase, and it would suggest a cover up attempt on her part. She let it go, and Blatchley answered.

"Physically, no. He's beyond the stage where that's necessary, just as a human child his age would be."

"Please, just answer the question, Doctor. Don't give us an explanation."

"Well, we might curtail his TV or something like that."

"Suppose Adam decided he wanted to leave the institute, Dr. Blatchley. Would you permit him to do so?"

Blatchley had discussed this point with Ruth the day before. Like any obvious question, it was anticipated and the answer planned. "No," he said, "we wouldn't."

"Pass the witness," Monte said.

This wasn't in their game plan. Blatchley was left sitting in the witness chair with his last answer hanging out in full view of the jury. He assumed Ruth would take care of that, now that she had the opportunity. He'd been a witness before, in other cases, and knew something of the routine.

But she fooled him. "I have no questions of Dr. Blatchley at this time, Your Honor. However, I may call him in rebuttal after the Government finishes."

"Very well, you're excused, Dr. Blatchley. I'll remind you you're still under the rule. You may not discuss this matter with anyone, except the two attorneys in this case. Each of them has a right to talk to you about your testimony if you are agreeable to doing so."

Blatchley replied that he understood, stepped down, and walked stiffly out of the courtroom.

"Call your next witness, Mr. Monte."

Monte sent the A.I.C. out the door. A few moments later he was back with a young woman in tow. She walked up to the bench without any direction and raised her right hand, all of which marked her as a professional. She settled

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herself in the witness chair, and Monte began.

"Please state your name and occupation."

"Mona L. Aikenhead. I'm a psychiatric social worker employed by the State of Texas, Department of Human Resources."

"Are you assigned regularly to any particular branch of that department?"

"Yes, I'm attached to the Juvenile Hall and have been for the last five years."

"Are you certified in that specialty by the state?"

"Yes."

"And would you tell the court what special training you've had and what degrees you hold which qualify you for the position you occupy?"

Before she could answer, Ruth stood. "We'll stipulate as to the witness's qualifications in the field of psychiatric social work."

She sat down and Schóonover was all over her. "Why did you do that?" he asked in a whisper. "You're supposed to be helping me."

"She's got more degrees than you have clean shirts, Delmar. What would you rather have the jury see: an impressive expert or a nosy, big-mouthed busybody? Shut up and listen."

". . . school children. Usually they're only the disturbed ones, but occasionally we get one that's the victim of a broken home, by death or divorce."

"What is the age range of the children you work with?"

"From infants on. Sixteen's the limit."

"Are you acquainted with a creature called Adam?"

"Yes, I am."

"How did you become acquainted with him?"

"He was brought to us on November 12, by the sheriff."

"For what purpose, Mrs. Aikenhead?"

"Custodial care. He'd been in federal custody as a material witness in this proceeding. They don't have their own facilities so they use the county's. However, Adam's a juvenile; the sheriff couldn't hold him in jail, which is what he'd ordinarily do."

"To your knowledge are there any judicial proceedings pending anywhere which affect Adam, aside from the commitment order issued in this cause?"

"No. We anticipate there may be, but there aren't now."

"What arrangements did you make for Adam's care?"

"Well, our normal procedure would be to select a foster home for him from our list of approved people. We didn't feel that would be appropriate in this case."

"Why not?"

"He's different. He never had any contact with other children before and we felt the shock of meeting them should be a controlled event to lessen the impact. There was also a need to insulate him from the media people."

"Who actually has physical custody of Adam now?"

"My husband and I do. I felt his case was important enough to justify personal intervention."

"I see. You've had considerable experience with handling children, haven't you?"

"Yes, professionally speaking. I don't have any of my own."

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And you are a trained observer when it comes to handling them?''

Yes.

Have you had Adam under your observation for long enough to have formed a judgment as to his level of intelligence?''

Yes.''

Have you administered any intelligence tests?''

Yes, I have.''

What kind of tests were they?''

Well, they vary. Some are designed for manipulative skills, some for object recognition, some for the ability to conceive relationships between two or more objects or geometrical patterns.''

''How did Adam do?''

''Very well with the manipulative and object recognition, poorly on the other.''

''From your observations and the test results have you been able to form an opinion of his level of intelligence?''

''Yes.''

''What is that opinion?''

''The tests indicate that Adam is functioning slightly below the low-grade moron level. However, it is also my opinion that the tests were of marginal value in his situation.''

''Please explain that.''

I am of the opinion that he's actually brighter than the tests would indicate. The tests were designed for human children. They don't necessarily fit Adam.''

''Mrs. Aikenhead, is Adam an ape?''

Objection. Your Honor. The question calls for an opinion this witness isn't qualified to state. The stipulation we made recognizes her expertise as a psychiatric social worker, not as a zoologist.''

Sustained.

Ruth knew Monte had wanted that question answered badly. He'd keep at it until he'd gotten the idea across to the jury, no matter what she did. But she wouldn't make it easy.

''O.K.,'' he said. ''I'll rephrase the question, Mrs. Aikenhead. Are there any human attributes that you can think of, normally found in any human child, that Adam does not possess?''

Before Ruth could stand and object, the witness answered with a resounding ''no.''

Ruth stated it belatedly. ''I object to the question: first, because it's leading; second, because it calls for an opinion outside her expertise; and third, that if she were otherwise qualified to answer, the foundation for the question is insufficient.''

Cook raised his head, peering at her through rimless glasses, and his gaze told her she lost the toss. ''I believe she's qualified to answer,'' he said, ''and although the format was somewhat out of the ordinary, I can see no harm in it. However, I'll admonish Mr. Monte to refrain from asking such questions. So far as the foundation is concerned, even as a lay person with the normal acquaintance with children she'd be qualified to state she knows what these attributes are, and that she can or cannot discern their presence or absence in this individual. The objections are overruled and your exception will be noted in the record. Mr. Monte, you may proceed.''

''I've concluded my direct, Your Honor. I'll pass the witness,'' Monte said with a smile.

Ruth would like to have excused Mrs.

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Aikenhead at that point. She'd expected someone like her to be called to testify, of course; but as with any expert, cross examination could sometimes do more harm than good. In view of the judge's remarks, impeaching her was probably impossible. The most she could hope for was to chip away at credibility and try to reach to the point where the jury might conclude Mrs. Aikenhead just didn't know what she was talking about. She'd have to give the situation a couple of licks for that reason alone. But there was another reason, which was part of her overall strategy: to extend the rabbit trail past the point where even Monte's skills wouldn't save him. Monte was good. He was impressive and he knew how to lay out a case. But it was on cross that Ruth shone. She hoped she'd know when to stop. There was always the danger of opening up new doors better left closed.

So she decided to be firm while keeping the gloves on, opening with innocuous questions.

"Mrs. Aikenhead, as you look at me, am I a human being?"

"Yes."

"Are you?"

"Of course."

"When did you become a human being?"

"Why, I've always been one," she answered, sounding astonished.

"Do you see any creatures in the courtroom who aren't human beings?"

"No."

"If someone in the courtroom weren't human, would you know it?"

"I suppose. I don't quite see what you're getting at."

"How would you know?"

"I'd just know. Anybody would."

"You have scientific training, do you not?"

"Yes."

"You hold academic degrees in scientific subjects?"

"Yes."

"Are you speaking as a scientist as you testify here today?"

"Well, I use my training to answer the questions. Yes, I am."

"Humanity is a scientific term, is it not?"

"Yes."

"A scientific status is capable of definition in scientific terms, isn't it?"

"Yes."

"What is meant by the term *human?*"

Sensing a trap, the witness paused and considered. "Human relates to the dominant species of life on Earth."

"I will concede that that is an analogy, but I want your definition. What do you mean, human?"

"What do I mean? Well, human means to have human form and human intellectual capabilities. That's what human means."

"Perhaps I should ask the question in more basic terms, Mrs. Aikenhead. What are the intellectual capabilities of human beings?"

"Human beings are capable of reasoning, having logical thoughts and behaving in an orderly manner."

"Would you agree that any being capable of doing this would be human?"

"That would depend," said the witness.

"Upon what?"

"Well, a human being has a human appearance."

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"You'd add physical form as a qualification, also?"

"Yes, I think so."

Suppose, Mrs. Aikenhead, you were to construct a robot, giving it human form and appearance, which was capable of doing the things you've just described. Would it be human?"

"No, it wouldn't."

"Why not?"

"Because it's not alive. A human being is alive."

"What is the definition of alive?"

"Well, something that's alive has recognizable bodily functions that maintain its life."

"That's not a definition."

"When something is alive it has sensation, it finds and consumes energy, disposes of waste and reproduces its kind."

"I see. If a robot could be made which would do these things, as well as the others you've mentioned, would it be a human being?"

"No, I don't think so."

"Why not, Mrs. Aikenhead?"

"Because there's more to humanity than that. Much more."

"Tell the jury what else there is."

The witness took that literally and turned to address the jury. "Human beings feel like human beings. They laugh, they cry. They experience happiness and they feel grief and they have moods."

"If these qualities and characteristics could be instilled in our robot, Mrs. Aikenhead, would it be human?"

The witness stared at the jurors, who waited for her answer. She had known Ruth's question would reach this point and dreaded it. But there was nothing else she could say. "Yes, it would be human."

"So we now have a definition of a human being, don't we?"

"Yes."

"Let me summarize and ask you if you agree. A creature that thinks logically and behaves reasonably and orderly, which is alive and has human physical form, and which has the capacity to experience the emotions you've just described, is a human being. Could you agree with that definition?"

Ruth waited. "Is that a fair statement?"

The witness looked alternately at Monte and at the jury. Finding no help there, she answered weakly, "Yes."

Ruth was about to stick her neck out. The Bible Belt might not be the best place to ask the next few questions, but they were essential to her strategy.

"Do you believe in God, Mrs. Aikenhead?"

"Of course."

"How about angels?"

"Yes."

"Good and bad?"

"Yes."

"Are any of these entities human beings?"

"No."

"Why not?"

"Because they're spirits. They're superior to human beings."

"It's commonly believed that all are capable of taking human form, isn't it?"

"Yes."

"And that they sometimes do?"

"Yes."

"Under these conditions are they then human?"

"No."

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"Why not?"

"Because they only look human. They have the form only."

"The differences are imperceptible. Would that change your answer?"

"No. The observer would merely be fooled. It wouldn't change the reality of the situation."

"You'd consider divinity a special case?"

"Yes," said the witness, looking relieved.

"Are there any other special cases you can think of?"

"Not offhand, no."

"Mrs. Aikenhead, it's generally conceded that the universe is a rather large place, isn't it?"

"Yes."

"Large enough so that we don't know its limits or even if it has any limits?"

"Yes."

"All we know about it is what can be observed from Earth?"

"Yes."

"Do you believe that somewhere out there there are other worlds which have life?" Ruth saw Monte flinch at that but he didn't object.

"Yes," came the answer.

"Do you believe it is possible that there is life out there which is equivalent to man in intelligence?"

"Probably."

"Is it not possible that some of it is man's superior in intellectual capability?"

"Yes."

"If this is true and such life in fact exists, and if it had the attributes described in our agreed definition of humanity, would you be prepared to accept it as human?"

"Well, I don't know. It would depend."

"Upon what?"

"On how I felt about it when I saw it."

"Are you saying that the effect on the observer is also a part of the definition?"

The scientist in her would not permit the affirmative. "No, it isn't." But she had accepted a robot; why not an extraterrestrial?

"So humanity actually is not an Earthly term, is it, Mrs. Aikenhead?"

"No."

"It is a universal term?"

"Yes."

"A creature that meets the standards is human; a creature that doesn't is not?"

"Yes."

"Even if it looks human?"

"Yes."

"Adam looks human?"

"Yes."

"Not exactly like you and I, but close?"

"Yes."

"But not nearly as close as the average idiot?"

A stunned look washed over the witness's face. "Idiots are human."

"Do they meet the definition we just agreed on?"

"Well, no. No, they don't. But that's because of physical defects."

"Does the definition require us to take the reason into account?"

Monte was on his feet objecting, "Counsel's arguing with the witness, Your Honor."

"I'll allow her to answer. In my

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opinion it's proper cross-examination, Mr. Monte. Overruled."

Answer the question, Mrs. Aikenhead. The objection's been overruled." Ruth let her know she meant business.

Resigned to the fact that Monte couldn't help her, the witness became sullen. "No," she answered reluctantly.

Neither does a person who's been deprived of his reason by illness, such as schizoid."

Under the definition we're using, I guess not."

Not would a baby."

No answer. Ruth ignored the fact; she went on.

There was a time when you and I and all of us in this room weren't human, wasn't there?"

Again, under the definition we're using, I suppose so."

Is there something else which we should add, Mrs. Aikenhead, to improve the definition?"

The witness was silent. Ruth let her take her time, but after waiting almost a minute she felt she had to move. "Mrs. Aikenhead?"

No. I can't think of anything we could add."

Yet you're not comfortable with the answer you're getting under the definition."

No, I'm not."

Is it possible, Mrs. Aikenhead, that the term is not capable of definition?"

"Yes, I suppose it is."

It was time to quit. And Ruth did. She had proven her point and then provided the witness with an escape hatch. The witness had taken it. She could do nothing else. What Monte would do about it was not at once apparent, and it would be an hour and a half before they knew. The Judge had given him the choice of going ahead now or continuing after lunch, and he had chosen to play for time.

She and Schoonover waited until the courtroom had been cleared and then, in the company of escorting guards, went to her car, now parked officially in one of the probation officer's spaces. Once underway, Ruth headed for North Beach.

"Where are we going?" Schoonover asked her.

"Anywhere, away from the crowd. I'm not particularly hungry, are you?"

"No. I'm too excited."

"Why don't we just park for a while?" She turned and smiled. "You can't get in any trouble in this car, I don't think."

"Right now that wouldn't seem like trouble. Can you tell how we're doing yet?"

"There are trends emerging. I think Monte took the bait. We won't be able to tell for sure until he tries to rehabilitate Mona Aikenhead, if he does."

"You mean he might not. Oh, but that'd be great. Do you think there's a chance? I mean, you really worked her over."

"There's a good chance he won't try. I wouldn't."

"But she's a crucial witness."

"No, she isn't. You said that because you think like a layman. You haven't got the legal training to appreciate what happened up there. Monte knows this case is going to be decided on emotion, not logic. He thinks he already has it

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made. So Mona Aikenhead can't define the term 'human.' So what? She knows one when she sees one. So does the jury. They know in the viscera."

The car came off the end of the bridge, took a 180° turn under it, and headed south toward the ship channel, where there was a small park. Ruth pulled it up to the seawall and cut the engine. "Do we stay in or walk?"

"Let's go up on the lookout. I might want to jump and get it over with. It sounds like you think we're going to lose."

"There's always that possibility, but I try not to think about it. I don't intend for it to happen."

They got out of the car and started up the stairs, which took three flights to reach the top. Below, tugboats struggled to push an aged, rusty tanker away from its berth. For a while they watched in silence.

"It's nice up here," Ruth said. "Did you ever get the urge to just get on one of those and go wherever it went?"

"Sounds like a good idea. Shall we swim for it?"

Ruth took Delmar's arm, raised it, ducked under, and wrapped it around her.

Troubled as he was, Schoonover had to admit that his relationship with her, while somewhat irregular and certainly unorthodox, had many advantages. He thanked his good fortunes for her aggressiveness. He, himself, was far too shy, and his life style far too sheltered for this to have happened in any other way.

Long moments passed and they stood there, facing the wind and looking out to sea, where the waters lay bright blue and untroubled. How easy it would be for him to run from this, thought Schoonover. "But I can't."

"Can't what, Delmar?"

"Did I say that out loud?"

"Uh-huh. Can't what?"

"I can't run. That's what I want to do. I'm not a fighter, Ruth. I never have been."

"You don't have to, Delmar. That's my job. It's up to me to take my battleaxe and cave Monte's roof in, just like they did in the old days. Nothing's changed."

"I know you're trying hard, Ruth. And I don't want to seem ungrateful, but I can't help feeling things are turning out all wrong. I guess I'm just too used to the physical world where things are real. Law's just a muddle."

"Uh-huh! And I'm a shaman rattling bones. Is that how you see me?"

"Please, Ruth. It's nothing personal, but I'm used to concrete thinking and stable, disciplined scientific reasoning. I just can't see where all this mumbo jumbo is getting us."

Ruth turned and faced him, raising her hands to straighten his tie, and pulling on it rather harder than she'd meant to. It wasn't the first time she'd heard such talk, but coming from Delmar it hurt her a little. She tried not to show irritation, but he was sure to take it wrong.

"It's not mumbo jumbo, Delmar. It looks that way to you because you don't know the rules. You're not an expert. Your work looks the same to me, and both of us would consider the average mathematician mad. Everybody works in his own universe, Delmar. Rational thought requires boundaries, and law's

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no exception. Errant thinking is just as dangerous to me as it is to you."

"Are you sore at me, Ruth?"

"No, Delmar. If I were, I'd push you off the edge. No, I don't think the time will ever come when the layman will give lawyers the credit they're due for keeping the world running. You're not to blame for that; we are. We've been too secretive about what we do. People look at the results and don't understand why things worked out that way, so they think of it as magic. It isn't; it's far more basic. It's war."

"War!"

"Sure. Lawsuits are substitutes for combat. Nobles used to be able to wage law, challenge the other side to a duel and let God judge. In fact, that was the law of Maryland until the 1920s. They'd adopted the old English Statutes at the time of the revolution, and while wager was abolished in England, Maryland never got around to it. Until some sharpie with a pretense to noble lineage claimed the right to challenge an indictment by fighting the state's attorney."

"That's weird, Ruth."

"No, it's conservatism. Law's the most conservative of all professions. We hate change. Change destroys people's orientation in society; ruins society's stability. That's why a really workable government is always top-heavy with lawyers, and I mean from city councils on up. That's why most U.S. Presidents have had law degrees. It takes one to understand government. Croakers, like you, mess it up. Look what Allende did to Chile thirty or so years ago. Duvalier did an even worse job with Haiti, and scientists, in general, don't make very good political leaders."

"O.K., Ruth, so I don't understand politics. Where does that leave Adam and me? It seems to me that Adam's case is special. He's unique, and the law ought to take that into account. Couldn't there be an exception in his case?"

"Not unless the legislature says so, Delmar. They haven't seen fit to change the law, and the courts can't. It's not their job, not that they don't sometimes try.

"Besides, they don't have to. Adam's unique to science, but legally speaking, he's old hat. The law's handled his kind before, and there's a very large body of precedent on the subject."

"Huh?"

"Sure, Delmar. We're way ahead of you guys. You think blacks were always human? Don't you believe it. It took the 13th Amendment to make a black man your legal equal. Even that didn't help black women. You'd be surprised how few rights married women had a hundred years ago, even as humans. And Indians. Indians achieved humanity after blacks did, when they finally gave up shooting arrows at the white man and started filing lawsuits instead. It was the same old battle, fought a different way. A way where they really had a chance to win. There, does that make you feel any better?"

"I don't know. It seems to me that what got the black people out of trouble got me in. I didn't mean any harm. They couldn't have meant me when they passed that law. That was over a hundred years ago."

"The law anticipates problems, Delmar, and works out solutions in a reg-

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ular, systematic way. That's what makes it so valuable. The precedents which are established can live on indefinitely. Law operates on the theory that if it's not broken you don't fix it, but if it is broken, fix it good. There are occasions when precedent has to be overruled, but you'd be surprised how rarely that happens."

"It sounds to me, Ruth, like lawyers are stuck in the past."

"We are, Delmar, and in the future, too. If we lose, and your case goes to the higher courts on appeal, their opinion may be cited as precedent a thousand years from now. Now, isn't that a pretty good reason for Judge Cook to be careful?"

"I suppose so. But I'm sorry to say I don't understand it any better now than I did before."

"Remember what I said a while ago, Delmar, about lawsuits being combat? I meant that. Aside from the fact that our rôles have been reversed, and we're missing an opportunity to do some serious necking, I'll bet you never thought of me as a general, did you?"

"No." He hugged the "general" close and kissed her.

When he finally let go, she said, "That's essentially what I am, you know. Every lawyer is. And every really good lawyer studies war. He has to, because that's the only way to win. Some lawyers have been generals, literally. Julius Caesar, for instance. Bismarck too. Lawyers were really active in the American Revolution and in the Civil War. Their influence might even have been decisive. And they were oddballs, mostly, who took a new look at things and spotted opportunities others didn't. It wasn't just the big names like Andrew Jackson or Breckenbridge or Moseby. There were lots of others, natural leaders, that you never heard of.

"You can see how a new angle can win for you. Look at Castro. In your lifetime he took a handful of guerrillas and beat a modern mechanized army with them. The profession's not all that proud to claim him, but he was undeniably successful."

Ruth glanced at her watch. "Aw, look at that, Delmar. It's time to go back. We'd better get started."

Ruth put the key in the ignition but didn't turn it. "Let's not be pessimistic, Delmar. If the case wasn't winnable we wouldn't be trying it. Only mediocre cases ever get tried, just like only mediocre wars ever get fought, and for the same reason. If I stood facing you with a .45 in my hand and you had nothing but a club, would we fight? Of course not. When one side or the other knows it can't win, the case gets dealt out. In the criminal end of it the D.A. just lets the grand jury know he doesn't want to indict and they 'No bill' it, or the hopeless defendant plea bargains."

"How do we win then, Ruth?"

"I think what's confusing you is the difference between the law and the facts. Each gets different treatment. That's why every lawyer wants a learned judge and an ignorant jury. The lawyers know what the law is if they've done their homework; the law is whatever the Supreme Court says it is at any particular time in history. But until the jury tells us what the facts are the law can't be applied. The jury resolves all factual disputes; they decide whether testimony

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is credible and how much weight to give it. Then the judge tells them what they're expected to do with the issues they've resolved. You can see how careful we are to keep out information that doesn't bear on these issues or has a tendency to be unreliable. Hearsay's a good example. It's generally considered incapable of direct proof. Of course, there are exceptions, like dying declarations, or ancient documents, made so long ago that their falsification for use in court is manifestly improbable. These are admissible like any other evidence."

"That part I appreciate, Ruth, even if I don't understand it. What I want to know is how, if everybody—you and Monte and the rest of these people—know both the law and the facts, how do we gain the advantage and beat them?"

"Because knowing something is one thing, Delmar, and using it is something else again. True, we're locked into the Matrix, the battlefield, so to speak, but we can maneuver within it. So we marshal our facts and march our witnesses across, in whatever deployment we judge most beneficial. We take advantage of procedural barriers to protect our flanks and hit where the enemy is weakest. Sooner or later, one side or the other will blunder. That happens one hundred percent of the time."

"And you think Monte will blunder. Is that what you're telling me?"

"No, I think he already has." She started the engine, and they drove off. For the rest of the trip neither spoke.

"You may proceed, Mr. Monte."

Monte stood up. "Your Honor, if it please the court, the Government will forego re-direct of Mrs. Aikenhead at this time and reserve the right to recall her in rebuttal at a later time."

So he's decided to keep the jury guessing, thought Ruth. *Good thinking!*

Judge Cook nodded. "Very well. Mrs. Aikenhead, you are reminded that although you have been excused you remain bound by the Rule. The marshal will escort you to the witness room. Call your next witness, Mr. Monte."

The A.I.C. rose and left the courtroom. He returned with a huge black man.

"I don't like this," Ruth whispered. "The ear test doesn't work on black people. I wonder who he is?"

"I know him," said Schoonover. "That's George Russell. You said Monte had been talking to an expert. George is an expert. He probably knows more about genetic engineering than any man alive."

"Where does he practice?"

"He doesn't. He teaches and researches. He's also on the editorial staff of the journal which published my papers."

"Then it's obvious why he's here."

"It is?"

"Of course. They'll want to get those papers into evidence. It's the next best thing to being able to call you to testify. They can't do that."

"What are we going to do about it?"

"We're going to let him put them in."

"What?"

"Shh. Delmar, did you say anything in your papers that wasn't true?"

"Of course not. I backed up every claim with experimental proof. Any-

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body can reproduce my results if they follow my instructions."

"And you never published anything you haven't shown me?"

"No."

"O.K. I'm going to stipulate. You already know the reason. And we'd never be able to keep it out anyway. Let's let the jury take the stuff in with them when they deliberate. They won't understand it even if they read it. Let's not give them the advantage of an explanation. O.K.?"

"O.K."

She let Monte get as far as name and occupation, then stood when he asked his first qualifying question. "We'll stipulate as to Dr. Russell's expertise in the field of genetics, Your Honor." She sat down.

Monte appeared delighted but not surprised. Ruth wasn't the kind of opponent who liked to waste time. Neither did he. He went right into it.

"Now, Dr. Russell, in addition to your teaching duties and your own research, you're also involved in the publication of a journal?"

"Yes. I'm on the staff of the *Journal of The American Society of Genetic Engineering*."

"Are you acquainted with Dr. Delmar Schoonover?"

"Yes."

"Do you see him in this courtroom, and if so, would you point him out?"

"Yes. He's wearing a blue suit and glasses and sitting next to a woman at the table in front of me."

"When did you first become acquainted with him?"

"Oh, let's see, about seven or eight years ago, I think, yes. It was at a seminar, in Switzerland; University of Bern."

"Since that time have you and he corresponded?"

"Yes."

"Did any of your correspondence relate to his work on genetic birth defects?"

"Yes."

"Did he submit any papers on the subject for publication in the *Journal*?"

"Yes."

"How many?"

"Four."

"Did you publish any of them?"

"Yes. We published all of them."

"When?"

"If my recollection is correct, they're all in the last four issues."

"Have you read these papers yourself?"

"Yes. I read both the manuscripts and the published articles."

Monte went to his file and took out four magazine-sized objects. The reporter marked them on his instructions, and forgetting to ask leave, Monte approached the witness.

Ruth noted the critical look on the judge's face, but he was apparently willing to let the transgression pass in the interest of brevity.

Oblivious, Monte continued.

"Now, Doctor, I'll show you what have been marked Government's exhibits 12, 13, 14, and 15 and ask you to examine them."

Russell took them, examined them.

"Can you identify these objects?"

"Yes."

"Please do so."

"Exhibit twelve is the issue of the *Journal* published in June 1994. Thir-

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teen is the September issue of the same year. Fourteen was published in December, and fifteen in March of 1995."

"Dr. Russell, are these the issues which contain Dr. Schoonover's articles?"

"Yes."

Monte took the journals from him and started for Ruth's table. Ruth waved him off. He looked puzzled, as if expecting her to interrupt and renew her motion to suppress at this time. However, he continued without pause.

"Your Honor. The Government moves for the admission of its exhibits numbers twelve through fifteen."

"No objection, Miss Purley?"

"None, Your Honor."

"There being no objection, they are admitted."

Monte got back to his witness. "Dr. Russell, you said you read the papers more than once, if I'm not mistaken. Is that correct?"

"Yes, sir."

"Do you have personal knowledge of their contents?"

"Yes."

"Do you understand their contents?"

"Yes, I believe so."

Ruth knew what Monte would try next, and what he would expect her to do about it. She was resolved to disappoint him even though it might encourage him to go further than she might like. If she had correctly assessed his attitude, he was convinced she'd written Schoonover off and was just playing out the string. That's what he'd probably have done. Most lawyers would have, but not Ruth Purley.

She let Monte have his head, and the testimony droned on. For over an hour Monte pumped innocuous bits of useless knowledge out of Russell and into the jury box. The jury looked bored and Ruth was certain they understood none of it.

Yet Monte wouldn't quit. Was Schoonover's work important? Russell agreed that it was, called it a breakthrough.

Did Russell have an opinion as to Adam's status as a person? Ruth stopped that with an objection, and the judge ruled the stipulation didn't qualify him to give an opinion as to an ultimate fact outside the field of genetics.

Monte did get one lick in, however, that Ruth felt was highly prejudicial to Schoonover's case. That was when he expressed an objection to further experiments which raised primate intelligence.

"Such artificial races would be abused," he answered. "My ancestors were slaves for four hundred years because their skin was black."

Ruth managed to get the remark stricken, but she knew no juror could possibly fail to be persuaded by such words, especially when uttered by a man as impressive as Russell.

She did not cross examine, which caused an expression of great relief to appear on Judge Cook's face. He wanted to move things along.

"Mr. Monte, it's now four o'clock. Is your next witness going to take long?"

"I plan to call Madelyn Hundin, Your Honor. Direct should take half an hour. Of course, I have no way of knowing how long Miss Purley will be."

"The court is prepared to stay a little late, counsel, if that's your pleasure, or

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[illegible] Monte finished and started [illegible] the morning.

[illegible] inspection to spit out it [illegible] Ruth replied.

[illegible] Monte stood. The [illegible] call: Madelyn Hun-

[illegible] passed. Then McGill entered the [illegible] about 40. She was dressed in a light green tailored suit, the jacket of which covered a blouse of some silken material, in a red and gray [illegible] pattern. Her hair was short, black and [illegible] and slightly curled. [illegible] her before the person, although she had been on TV at [illegible] for the past month. She wouldn't have liked [illegible] Aside from her youth and beauty [illegible] But she had a [illegible] attractive and [illegible] formidable witness. [illegible] Monte began. "Is [illegible]?"

[illegible] married. [illegible]

[illegible] Brandin [illegible] 418 [illegible] Avenue, Chicago."

[illegible] occupation, Miss [illegible]

[illegible] for the *National Ex-*

[illegible] how long have you been so employed?"

"Not quite 18 years."

"What kind of publication is the *Intelligencer*?"

"It's a weekly newspaper. It comes out every Tuesday, nationally."

"Now, Miss Hundin. Are you acquainted with Dr. Delmar Schoonover?"

"Yes."

"How did you meet Dr. Schoonover?"

"I went to see him at his laboratory at the Blatchley Institute."

"When was this?"

"January 12th of this year."

"What time of the day was it?"

"Early afternoon."

"Did you see anybody else there besides Dr. Schoonover?"

"Well, I don't remember everybody I met. There were a lot of workers around, but I did talk to Dr. Blatchley for quite a while. He showed me around."

"Is there anybody else you saw that day whom you remember?"

The witness's face took on a faraway look and her voice was drawn as she answered. "Yes, the child, Adam."

My God, thought Ruth, *a ham actor!*

"Objection. Your Honor; her answer states facts not in evidence. It has not been established that Adam is or is not a child. We'll also move to strike."

"Sustained; the answer will be stricken and the jury is instructed to disregard it."

Monte appeared unruffled. "Can you describe Adam?"

"Yes. He's a little fellow, about two-and-a-half feet tall, with black hair and the biggest brown eyes you ever saw. And he was wearing glasses, and little white coveralls, and no shoes."

"What was he doing when you first saw him?"

"Climbing around up on the ceiling."

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"While this was going on what did you do?"

"Well, I had my camera so I snapped a few pictures."

Monte addressed the court. "May I approach the witness, Your Honor?"

Leave was granted and he walked to the stand, pausing briefly to retrieve the pictures from the reporter.

"Miss Hundin. I now show you what have been marked as Government exhibits one through eleven and ask you if these are the photographs you took?"

"Yes," she said, shuffling the photos. "Here's the one where he was losing his glasses."

"It would appear, Miss Hundin, that the coveralls are soiled."

"Yes. He was pretty dirty from crawling around in those pipes."

"Did you mention this to Dr. Schoonover?"

"Yes."

"What was his reaction?"

"He said Adam was a great help to him; that he'd take a shower and be as good as new."

"Did you express any concern to him about the danger of falling?"

"Yes, I told him I thought it was too dangerous for a little boy."

"Why don't you object to this, Ruth?" Schoonover whispered. "I thought they couldn't use hearsay."

"Shh. It's not hearsay if a party says it. It's an admission against interest. You're expected to deny it if it isn't true."

"How can I if I don't get to testify?"

"Let me alone, Delmar. I gotta listen."

The witness droned on. ". . . told me the child did all sorts of hard work around the place; work I wouldn't want to do."

"Did you have any conversations with Adam, Miss Hundin?"

"Well, I tried, but he's hard to understand, you know. He doesn't talk very plainly. But it seems to me I asked him . . ."

Monte interrupted. "Don't tell us what the conversations were about. You did have words with him, though?" He obviously didn't want to give Ruth a chance to rattle the witness with valid objections.

"Yes," the witness answered. "I did."

"Did you see any kind of safety devices in use while Adam was up on the pipework?"

"You mean nets or ropes? No, I didn't see any."

"Did Dr. Schoonover explain the absence of any such devices?"

"Objection, Your Honor. Counsel's leading the witness. Her prior testimony was that she didn't see any, and there's no proof she asked for an explanation."

"Sustained."

"I'll withdraw the question. Did you ask Dr. Schoonover whether any safety precautions were taken when Adam went in the pipes?"

"Yes."

"What was his answer?"

"He said Adam didn't need them. He had natural climbing ability. He said all chimpanzees did."

"Miss Hundin, did Adam look like a chimpanzee to you?"

"Objection. No proper foundation for the witness to express such an opinion." Ruth knew it wouldn't stick but did it anyway to irritate Monte.

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"Overruled. It's within the knowledge of the average lay person. The witness may answer." The judge's face told Ruth he thought the objection was frivolous, and his eyes were on the clock.

"Why, no, he didn't. He looks like a little boy."

"Did he act like a little boy?"

"Yes."

"Did anything else unusual happen while you were there?"

"Well, I wasn't in Dr. Schoonover's laboratory all that long before he told me to leave."

"Do you know why he wanted you to leave?"

"It was because of what I'd said about the climbing. He told me it wasn't any of my business what they did there."

"Did you then leave?"

"Yes."

"Did you ever see Dr. Schoonover or Adam after that?"

"Well, I never saw Adam again. And I didn't see Dr. Schoonover until I came in the court room a while ago."

"Had you ever met Dr. Schoonover before that day in the laboratory?"

"No."

"Pass the witness."

Now it was Ruth's turn. "How did you happen to go to the institute on January 12?"

"I knew a man in Chicago who told me about the experiments. It seemed to be news so I went to get the story."

"The paper you work for is generally considered to be part of the so-called Sensational Press, isn't it?"

"Yes. That has been said about it."

"During your eighteen years there have you ever heard any one refer to the *National Interrogator* as a scandal sheet?"

Monte was on his feet immediately. "I've never heard a more inflammatory question put to a witness in my entire career, Your Honor."

"Neither have I, counsel. The objection is sustained, and Miss Purley, there will be no more of that."

Didn't work, thought Ruth. Once in a while she could mousetrap a prosecutor into moving for a mistrial, but Monte had obviously lost the reflex. He'd been a prosecutor too long. She continued, this time more cautiously.

"You've been a reporter for a long time, haven't you, Miss Hundin?"

"Yes, since college."

"How many stories do you think you might have written in that time?"

"Oh, thousands." The witness shrugged. "Ten thousand, maybe."

"What is it that determines whether a story gets published or not?"

"Well, it has to be newsworthy. Otherwise who'd read it?"

"Would it be correct to say that the more unusual a subject is, the greater interest the public will have in it?"

"I suppose so. Man bites dog, that's news."

"You have to develop methods of finding these situations?"

"That's part of the job."

"Would it be correct to say that unusual stories sell newspapers?"

"Yes."

"And if a reporter gets a lot of good stories and sells a lot of papers this makes the publisher happy?"

"Of course."

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"And grateful?"

"I guess so."

"And the reporter is rewarded?"

"For a good job, yes."

"Gets a bigger paycheck, maybe?"

"Maybe."

"So it's good for you if you can sell papers?"

"Yes."

"Does it ever happen that a story turns out to be untrue?"

"Of course. It happens all the time."

"What do you do when that happens?"

"We don't publish it."

"Do you manage to catch all the errors?"

"Well, occasionally one will get by us."

"But you try to be careful?"

"Yes, always."

"You check things out?"

"Yes."

"And still they get by you?"

"Like I said, sometimes. Nobody's perfect."

"What do you do when this happens?"

"We generally publish a retraction."

"Have you ever had to do this?"

"Yes."

"When was the last time?"

"About Christmas, last year."

"How many times have you had to do this during your eighteen years at the paper?"

"Maybe four or five."

"Possibly more?"

"Possibly. That's a long period."

"So you're not right all the time?"

"I never said I was."

"Is the retraction the last thing that's done, where there's an error?"

"No, not always."

"What else is done?"

"By us?"

"By anybody."

"Sometimes there are lawsuits."

"Objection, Your Honor; move to strike her answer. It's irrelevant." The prosecution wasn't too happy with that line of questioning.

"She's the Government witness, Your Honor," Ruth protested, "and the relevancy will be established if I can continue."

"This is cross examination, Mr. Monte, and she's entitled to explore the witness's knowledge and test her credibility. I'll overrule you. Continue, Miss Purley."

"Has a lawsuit ever been filed against the paper because of a story you wrote, Miss Hundin?"

"Yes."

"Do you know whether any of the plaintiffs have recovered judgments?"

"Yes."

"How many of them do you know of?"

"In eighteen years?"

"Yes."

"Six."

"On stories you yourself wrote?"

"Yes."

"Are there any lawsuits pending at the present time which are founded on stories you wrote?"

"Yes."

"How many?"

"Three."

"What is the basis of these suits?"

"I told you. Stories I wrote."

"Let me ask you again. Is it true that these are defamation suits?"

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[illegible] for [illegible]

[illegible] judgments collected in the [illegible] against the paper, in which [illegible] party defendant, how [illegible] were for libel?"

[illegible]

Looking back, Miss Hundin, using hindsight, do you feel these situations might have been avoided?"

"Objection, Your Honor," yelled Monte. "The answer could have no probative value."

"Overruled. Sit down, Mr. Monte."

"I'll answer," said Ruth. "I suppose so."

"How?"

"Any more investigation probably would have helped."

"Tell the jury what you did in the way of investigation before you wrote your first story on Adam."

"Well, as I said, I heard about the [illegible] was available at the [illegible] Public Library, so I read [illegible] then I told my editor and got [illegible] here for an interview."

"Anything else?"

"I bought a pass for Carnival Land that I gave away. I rented [illegible] the Blatchley Institute."

"Did you see Mr. Adam or [illegible]?"

"Not at first. I spent most [illegible] with Mr. Blatchley, [illegible]. He seemed reluctant to take me through. I didn't have an appointment, though."

"Did you let him know you were coming?"

"No."

"Why not?"

"It's not generally a good practice in this business. It ruins the spontaneity if people expect you."

"Did Dr. Schoonover know you were there?"

"I don't think so. He didn't act like he was expecting me."

"How long were you in Dr. Schoonover's lab?"

The witness shrugged. "Five minutes—ten at the most. I wasn't particularly conscious of the time."

"And it was on the basis of this interview that you wrote the first story?"

"Yes."

"And several follow-up stories?"

"Yes."

"Have you ever heard of Giuseppe Bongiovanni?"

"Yes."

"Who is Giuseppe Bongiovanni?"

"He's an aerialist. I did a story about him last month."

"His family, too, aren't they part of his act?"

"Yes, them, too."

"That includes two pre-teen children, a boy and a girl?"

"Yes."

"Is there any question in your mind that the Bongiovanni children are human children?"

"Of course not."

"What part do they have in the act?"

"They perform on the trapeze."

"Have you ever seen them perform?"

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"Yes."

"How high off the ground do these performances take place?"

"Well, I've seen them twice, in different places. It varies."

"Where did you see them the first time?"

"At the circus, in a tent."

"How high was the trapeze?"

"I'm not good at judging distances."

"Was it higher than the pipes Adam was climbing?"

"Yes."

"Twice as high?"

"Yes."

"Three—four times as high?"

"I don't know."

"How about the second time?"

"That was in the Chicago Arena."

"How high was the trapeze that time?"

"About the same, I guess. But they always used a net."

"Always?"

"Yes."

"May I approach the witness, Your Honor?"

"Yes, counsel."

Ruth opened her case and took out a tabloid-sized newspaper. Paul marked it and she took it to the witness chair. "Now, Miss Hundin, I'll show you what has just been marked as Defendant's Exhibit Number 1 and ask you whether or not you can identify it."

"Yes, it's an issue of the *National Interrogator* dated October 17, 1995."

"Would you please look through it and see if it contains anything you wrote."

"I'm sure it does. I'm in there every week." She thumbed through and stopped at page 28.

"You've found a story, have you?"

Monte stood up. "Your Honor, if she's going to examine the witness as to the exhibit I'd like to examine it first."

"She's still in the identification stage, Mr. Monte. However, since you have interrupted, perhaps Miss Purley could show it to you now and save the court some time." He said this with his eyes fixed on the courtroom clock.

Ruth dutifully retrieved the paper from the witness and took it to Monte's table. She waited, feeling a little sorry for him. His actions told her he hadn't seen it before, and mindful of the fact that the judge had him in the doghouse over the time, he could only skim it now. The big bold caption said "Child Daredevils Defy Death Daily."

In a minute or two he handed it back. Ruth glanced at his ears before turning back to the witness. "Read the story title to the jury, Miss Hundin."

The witness did so with some hesitation.

"Now, Miss Hundin, in spite of the net, it's still dangerous to work a trapeze at that height, isn't it?"

"Well, apparently not. They do it."

"You could fall and hit the net wrong, couldn't you? Or miss it altogether."

"Objection, Your Honor; calls for speculation."

"Sustained. Move along, Miss Purley."

"Miss Hundin, I refer you to the fourth paragraph down; first column; do you see it?"

"Yes."

"Please read that paragraph to the jury."

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"Although the law requires nets to be used in Illinois and a majority of the states in this country, Mr. Bongiovanni says he has no great faith in them as safety devices and commonly dispenses with them when working overseas."

Ruth looked over at Monte, who sat stone-faced, with his chin resting on his hand. The jurors were no more demonstrative. But wait until the next question, thought Ruth.

"Naturally, Miss Hundin, you reported the abuse of the Bongiovanni children to the proper authority?"

"I don't know what you mean by that question," the witness protested.

"I mean, Miss Hundin, since the lives of these children were in danger, it was your duty to do something about it, wasn't it? Just as you did in Adam's case."

"My duty? Why, no. Besides, I didn't consider their lives to be in danger."

"Then why did you say so in your article? Here it is in bold print."

"I don't write the captions; just the story."

"Take a look at paragraph two, first column. Then tell the jury who wrote that."

The witness looked. "I guess I did."

"And it's the same as the caption, isn't it?"

"Yes."

"Identical wording?"

"Yes."

"But you don't consider those children to have been in danger?"

"Well, maybe there is some risk, but they're trained; their parents . . ." she never finished.

Ruth ignored the fact.

"Were these children in more or less danger than Adam was?"

"I don't know."

"But that was one of your complaints in the stories you wrote about Dr. Schoonover, wasn't it?"

"Yes." The witness obviously suspected Ruth would have them all tucked away someplace in her file.

"As a matter of fact, in your articles you compared Dr. Schoonover with Dr. Frankenstein, didn't you?"

"As I recall, the term was used."

"And you said he'd created himself a slave, didn't you?"

"No, I didn't say that. That must have been some other paper."

"You never said Dr. Schoonover solved his labor problems with a test tube?"

"I could have said that. I don't remember."

"How much were the Bongiovanni children paid for what they did?"

"I don't know; we didn't go into that."

"You don't know if, in fact, they were paid at all, do you?"

"No, but—"

"No, but what?"

"They were a family. If the family earned money they'd benefit."

"You mean, their work contributed to family finances and support."

"Yes, that's what I mean."

"How does Adam's relationship with Dr. Schoonover differ from that of the Bongiovanni family?"

"The Bongiovannis are related. Dr. Schoonover owns Adam. That makes the difference, if it's family."

"Did Dr. Schoonover say he owned Adam?"

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"No."

"Dr. Blatchley? Or Adam?"

"No."

"Then how do you know?"

"He owned Adam's parents."

"You know this to be a fact, of your own personal knowledge?"

"Dr. Schoonover's papers say this. I remember reading it. He told how Adam's mother treated him; how she was implanted with an egg fertilized by a male chimpanzee."

"Aren't you assuming that Adam's status would naturally follow that of his parents?"

"Yes. Doesn't it?"

"Your Honor, I'll move to strike the last remark as unresponsive."

"So ordered. The jury will disregard it."

"Miss Hundin, how did you get here today?"

The witness looked puzzled. "Why, I caught a plane this morning and the FBI picked me up at the airport."

"I'm sorry, Miss Hundin; what I meant to ask is whether or not you came because you were subpoenaed or whether you came voluntarily."

"Oh, I see. Well, Mr. Monte called me on the phone and asked me to be here."

Now for the kicker. Ruth always enjoyed this and always did it, even though she knew Monte would re-direct and clear it up. "Miss Hundin, prior to the time you took the witness chair did you discuss with anyone else what testimony you would give when you got here?" She settled back to enjoy the look of pure panic, and it came.

"Why, no."

"Absolutely no one?"

"No one at all. And," she added, "no one told me what to say."

"You're absolutely positive of this?"

"Yes."

"Did you talk to Mr. Monte this morning?"

"Yes."

"You've talked to Mr. Monte on other occasions about this case, haven't you?"

Monte rose. "Your Honor, if the court please, I'll object at this point. We all know what she's going to say next. And it'll be in the charge, as the court well knows, that a witness has the right to discuss the case with counsel. There's no harm in it, and my opponent's certainly not going to suggest that I told her what to say."

Oh, well, thought Ruth, *sometimes it backfires.* She said, "I don't mean to limit my questions to her conversations, if any, with counsel, Your Honor. But I'm entitled to know if the testimony we heard is the witness's own."

"She's already answered that, Your Honor."

"Yes, Mr. Monte. And I'm going to sustain the objection. Miss Purley, do you anticipate being much longer with this witness?"

"I was about finished when Mr. Monte objected, Your Honor. I don't believe I'll have anything further at this time."

"Any re-direct, Mr. Monte?" The judge had his eyes on the clock again.

"No," said Monte prudently. Having apparently gotten out of the doghouse by putting Ruth in, he wasn't about to try for a second term.

"Very well. We'll stand adjourned until nine o'clock tomorrow morning."

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As the court departed, Monte motioned to Ruth. She left Schoonover at the table and went to see what he wanted.

"It's not going well for you, Ruth, and I'm not through yet. Why don't you take my offer and plead him? It's not like I'm asking for hard time."

"He's not guilty, Bob. There's no reason to plead."

"Three years, probated. No fine. Fairer than that I couldn't be. What are you gonna say? That the kid's not human? The jury's never going to buy that. One look is all they'll need; in fact, I could do it with the pictures alone, without putting the kid on the stand."

"He's not going to testify, Bob."

"That's up to the judge, and I don't think he'll dare say no."

"I'll see," Bob. Is that all you want?"

"Yes, Ruth, but you know I'll try for the maximum if I have to ride you down. He'll get five and or five."

"You want your picture on the front page, huh? Well, so do I." She stomped off.

"What was that all about, Ruth?" asked Schoonover.

"I just had my arm twisted. But don't worry. I didn't sell you out. Monte wanted me to plead you and take three years' probation."

"I'm not so sure it wouldn't be smart to take it."

"No, Delmar, it wouldn't. You won't do any worse even if I get creamed. In fact, I think you'd be a cinch for a pardon. Don't fall for it. Besides, we're not going to lose."

"You keep saying that. I wish you'd tell me why you think so."

"Come on, let's go. The crowd's gone. Let's go to my place. I'll cook dinner for you."

Schoonover wasn't what you'd call worldly, but since he'd met Ruth he'd gotten used to her forward ways. Still, accompanying her anywhere where there might be a bed was risky, and he wanted to think. "Maybe I'd better just go home," he told her.

"Aw, come now, Delmar. You'd just sit around and worry. And the road's clogged with reporters. My place'll be quiet and comfortable."

"What's what I'm afraid of."

"I promise I won't bother you, unless you want me to."

"O.K."

She was as good as her word—for a while. Until after dinner, which he rated as uncommonly good for an improvisation. But when the clock struck ten he remembered the news came on. "Where's your TV?"

"In here," she yelled from the bedroom.

He started in the door.

"Get out of those duds and let's watch the news we made," she said.

The next morning on the way down, haggard from a sleepless night, Schoonover didn't have much to say. Ruth, however, was alert and cheerful.

"It's going a lot faster than I thought. Monte's overconfident, and it's made him lazy. He thinks it's greased. I was afraid he'd march in a squad of psychiatrists, but evidently he's not concerned with the human question. I'm worried about one thing, though."

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"What's that?"

"Rule 601. The competency rule. I know he's going to try to call Adam, and he's got the presumption with him."

"What presumption?"

"The one that puts the burden on us to show Adam's not competent to testify."

"It'd scare him to death. Just being here is bad enough. I'm sure he feels responsible for all that's happened."

"Monte's counting on it for shock value, just like I'm counting on your testimony."

"But you said I wouldn't be taking the stand."

"I know. But I changed my mind after I was sure my grand strategy was working. It doesn't matter now what Adam's status is. It's yours that really counts."

She wouldn't tell him why she said that, and once in the courtroom and back at the trial table he sat there mutely, trying to figure it out. Despite the conversation they'd had in the park the day before, to him law still reeked of sorcery.

Monte was seated at his table, talking to the AIC and looking confident. Everybody but Schoonover seemed happy and carefree. It didn't seem fair. To them, it was either entertainment or routine work they did every day. One was stimulated by the novelty; the other was soporified by routine. Schoonover almost wished he would lose. Then they'd throw him in jail and maybe the world would leave him alone. He wanted to get back to his work and back to normal. But normal meant back to Adam, and win or lose Ruth had warned him that might not happen, ever. There could be a long fight in the State Court no matter what they decided Adam was in this trial, unless she had a miracle ready to work.

Ruth batted his elbow. She was already standing. So were the rest of the people. He felt like a fool, rising just as everybody else was preparing to sit down again.

"Bring the jury in, Mr. McGill," said Cook.

Moments later in they trooped, behaving like bored veterans after one day on the job.

"Call your next witness, Mr. Monte."

Out went the AIC. There'd been no identification made to the court this time. Schoonover was sure that meant something. It did. In a little while the door opened and several hundred necks craned. Eyes popped and fingers flew across sketch pads. As far as the press was concerned, this was the climax.

Adam, still in the blue suit and white shoes, his hand in the AIC's, walked stoically toward the bench, smiling weakly when he spotted Schoonover. They stopped in front of the reporter.

Ruth recovered from her surprise. She had expected the DA to try this, but not so soon. She knew from checking his subpoena list that he'd called a lot more witnesses than he'd put on so far. It wasn't unusual for one side or the other to use such a smoke screen, but she wasn't so sure that was his idea now, although it might once have been. More likely she was right; he'd taken the bait and believed he could end it in one fell swoop. Well, not without a fight he wouldn't. "Your Honor," she said, "may counsel approach the bench?"

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"Come forward," said the judge.

Adam looked over at Schoonover, as though hoping the AIC would let go his hand so that he could go to him.

"Your Honor, the defense has a motion to make."

"Well, let's see it, counsel."

"It's oral, Your Honor. It concerns the competency of this witness."

"Counsel, you know the rules require all motions to be in writing whenever possible."

"It's a trial motion, Your Honor."

"Well, that's different. Do we need to send the jury out?"

"Yes, Your Honor," said Monte. "If it's what I think it is, we'll need to interrogate the witness."

"I don't agree with that part of it, Your Honor, but I'd like to be heard on the motion and we don't need the jury for that."

"O.K. Mr. McGill, take the jury out. I'll want them back here by ten o'clock."

Ruth stood next to the trial table while she addressed the court. She looked so small, thought Schoonover. Certainly the voice that boomed out was out of place in that body.

"The motion, Your Honor, is directed to the competency of the proposed witness, Adam. I would invite the Court's attention to the wording of Rule 601, which says, 'Every person is competent to be a witness except as otherwise established by these rules.'

"In that respect the language is identical to that of the 18 U.S.C. 1583. Both use the word 'person.'

"And that, Your Honor, is one of the ultimate facts to be decided by the jury in this case: whether or not Adam is a person within the meaning of either the rule or the statute. Since it is a factual issue and this is a jury trial, it follows that only the jury can resolve it. Until they do, Your Honor has no alternative but to rule Adam incompetent to testify. And that's not the only ground. If they decided he was there would still remain the questions of whether or not he would understand the oath, had sufficient intelligence to distinguish truth from falsehood, and whether his overall knowledge would permit him to comprehend the nature of these proceedings. These are all subsidiary issues. It is my contention, Your Honor, that for the court even to examine Adam at this point would be an error."

"Mr. Monte, have you any response?"

"Most assuredly, Your Honor." Monte stood, face flushed, ears crimson.

"In the first place, Your Honor, the Court has, in effect, already ruled on the motion by refusing to dismiss the indictment. The defense relied on the same grounds: the inhumanity of the victim. She has attempted throughout this trial to establish that Adam isn't human, but as the court pointed out early in this hearing, that isn't the issue. We've heard nothing cited to the Court which holds a person has to be human . . ."

"Mr. Monte," the judge broke in. "If you have a point to make, then make it. All you're doing, it seems to me, is repeating what she said."

Monte's ears got redder. His face took on a helpless look. "I reiterate, Your Ho—"

"And so do I, Mr. Monte. I'm ready

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to rule on the motion unless you can supply me with a reason not to."

Monte sat down. The game wasn't up without Adam's testimony, but it would ruin his finale.

The judge continued. "The court will rule with the defendant, declaring Adam to be incompetent as a witness at this stage of the proceedings. However, since the ruling is based on the questionable status of the witness as a person, in its constitutional meaning, the court will reserve its ruling on any testimony proposed to be given after the jury has resolved it—that is, in the punishment phase, should the defendant be found guilty, or in any ancillary proceedings. In addition, the ruling is without prejudice to the defendant to raise any other objections he may have which are within the contemplation of Rule 601. Mr. Marshal, bring the jury back."

Throughout it all Adam had stood there, his hand firmly held by the AIC. The jury was getting seated.

"Why is he still here, Ruth? It sounded to me like we won that round."

"We did, but just because he can't testify doesn't mean he has to leave the courtroom. The DA obviously wants the jury to get a long look at him. It would surprise me if he tried it, but he could have Adam marked as an exhibit and admitted in evidence."

"He could do that?"

"Theoretically. It's been done in West Texas with cattle and horses, although naturally, in that case, the court has to adjourn to wherever they are. I can't see the judge allowing that in this case if he can help it, and I don't think Monte'd try. I expect something sneakier than that."

"Mr. Monte," the judge asked, "are you ready to proceed?"

Before the DA could answer, the AIC let go of Adam's hand. Free, Adam ran across the courtroom, scurrying under the table and up into Schoonover's chair, throwing his arms around the startled man's neck. "Daddy!" he called, and began to sob.

The audience rumbled, drowning the Court's protests. Over the roar rose the sound of the clerk's pounding gavel. The AIC came over at once to get Adam, who clung desperately to Schoonover's lapels. "Go with him, Adam, please. Daddy wants you to."

The AIC picked Adam up and carried him, still bawling, out of the courtroom, and as he did so Monte rose. "Your Honor," he said, "the prosecution rests."

"And the defendant moves for a mistrial, Your Honor."

"On what grounds, Miss Purley?"

"That the prosecution provoked the incident the court just witnessed, for the purpose of arousing the sympathy of the jury to the prosecution's position."

"Mr. Monte, do you have anything to say to that?"

"Your Honor, certainly we regret it, but we didn't plan it or do anything to promote its occurrence. It just happened."

"Take the jury back out, Mr. McGill. I'll see both counsel in chambers."

When the courtroom was clear of jurors, they went back to Judge Cook's chambers. These were austere, but impressive, filled with mementos of Cook's long practice. He left the robe on, but sat behind his great desk and began

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stuffing a pipe. Ruth and Monte sat in defendants' chairs in front of it.

"I called you both back here because I didn't feel a courtroom full of reporters was the place to say this. You're both probably entitled to mistrials—Miss Purley for the rather unprofessional episode she complained of, and Mr. Monte because defense counsel had implanted the idea of prosecution trickery in the jurors' minds. Motions like that should never be made within the hearing of a jury, Miss Purley.

"So if either or both of you want me to do so, I will, and we'll start all over again this afternoon picking a new jury. If that's not your pleasure I'll give the jury an instruction to disregard both incidents and hope they do." He scratched a sulphurous match alight and puffed his pipe.

Ruth, realizing that a mistrial at this point could have no other effect than to present her with an educated opponent, who would know every facet of her case and who might not repeat previous blunders, remonstrated. The motion had been a stupid tactical one anyhow. It was something you did for the record, instinctively, for the benefit of the appellate court's normally good strategy, because if the trial court refused to grant it and the appellate court disagreed you got a new trial. Unless you lost below it was moot because in the federal system only the defendant can appeal. Under present circumstances it would be a mistake. A grave one.

She didn't feel the incident had hurt her. You intended to bring all of it out in her case anyway. Monte still had disadvantages in tackling he knew her real objective, but in time he'd get wise. "I'll withdraw my motion, Your Honor."

"Very well, Miss Purley. What's your pleasure, Mr. Monte?"

"The prosecution will go ahead, Your Honor. I can't see any advantage to the taxpayers to go through this again."

"O.K.," said the judge, examining his pipe, as though he'd like to smoke it a little longer. "Are there going to be any motions at this time?"

"None for the prosecution, Your Honor."

Ruth had considered a motion for a directed verdict. She had one prepared and ready for presentation. But she knew from experience that there was slim chance the court would take the case from the jury at this point. There was no way the judge could be persuaded that Monte hadn't made a *prima facie* case and produced enough evidence to require her to put on a defense. Anyway, she'd still have that option at the close of all the evidence.

"None for the defendant, Your Honor."

"O.K. You're both excused. We'll be in recess another fifteen minutes."

Schoonover sat down in the witness chair, crossed his legs and folded his hands, assuming the posture he and Ruth had so painstakingly practiced. Ruth began the questions.

"What is your full name?"

"Delmar E. Schoonover."

"What is your occupation?"

"I'm a doctor of medicine currently employed at the Blatchley Institute of Genetic Research."

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"Are you acquainted with Adam Schoonover?"

"Objection, Your Honor." Monte stood there sputtering.

"I'll hear the basis for your objection if you've got one, Mr. Monte. Otherwise sit down."

Monte sat down.

"Objection overruled," said the Court.

"Who is Adam Schoonover, Dr. Schoonover?" Ruth continued.

"Adam Schoonover is my son."

"Pass the witness, Your Honor." The audience froze.

To herself, Ruth thought, *Now you know, turkey. I just dumped your whole case.* She looked at the prosecutor, whose ears blazed fire. Yes, it had worked. The jurors behind him were animated too, and appeared to be shocked at the brevity of the direct examination. Among the spectators no fingers sketched or scribbled notes; no eye was anywhere but on the witness.

The DA, veteran of a thousand or more bouts with the area's best defense people, took some time to regain composure, to reorient his thinking, to bring it around 180° from where it had been, when he'd been struggling to prove Adam's humanity. He had an agile and orderly mind, trained to adapt, and he'd have to do that now. He used harmless questions to stall, to get time to think. He stretched them out with long pauses.

"Where did you go to school, Dr. Schoonover?"

"My undergraduate work was done at the University of Maryland, College Park. I took my M.D. at the University of Bern, in switzerland."

"Where did you intern, Dr. Schoonover?"

"Reading Hospital, Reading, Pennsylvania."

"Did you do a residency in any special branch of medicine?"

"No, I went right into research."

"You've never practiced medicine, then?"

"Not in the usual sense of the word, no."

"Are you licensed to practice by the State of Texas?"

"Yes."

"What kind of research do you do?"

"I call it preventive genetics."

"I see. Now, you've done some papers with respect to this research which have been published in the *Journal of the American Society of Genetic Engineering*, haven't you?"

"Yes, four of them."

"You're referring to the articles contained in Government's Exhibits 12, 13, 14, and 15? You know what those are?"

"Yes, to both questions."

"Doctor, you said that Adam was your son?"

"Yes."

"You're speaking figuratively, aren't you, not in the biological sense?"

"No."

"May I approach the witness, Your Honor?"

"Go ahead, Mr. Monte."

"Thank you, Your Honor. Now, Dr. Schoonover, I'm going to refer you to Government Exhibit 12, and ask you to note the title of your article."

Schoonover took the *Journal*, flipped it to the beginning page, and perused it.

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"What is the title of the article, Dr. Schoonover?"

"Genetic Augmentation of Primate Intelligence."

"That title would seem to suggest that elevation of intellect was your primary purpose, Doctor. Is that true?"

"No, it wasn't."

"Then why do it?"

"To determine which areas of the genetic code produce the increased intelligence in the first place. Then we'd know where to look for trouble."

"In pursuit of this goal you used chimpanzees, is that right?"

"Yes."

"How many did you use in Adam's case?"

"Two."

"One of these was a female?"

"Yes."

"Was the other a male?"

"Yes."

"Now, Dr. Schoonover, Adam was born of the female in the usual way after the normal period of gestation, wasn't he?"

"Yes."

"So there's a biological relationship and connection between the female ape and the child Adam?"

"Definitely."

"By the same token, an ovum was removed from her body, and this ovum was then fertilized with sperm from a male chimp and reimplanted?"

"Yes, that was done."

"So that it is correct to say that Adam is the child of these two apes: they are his parents."

"Yes."

"Yet you have just told the court Adam is your son?"

"Yes."

"You claim to be Adam's father?"

"Not exactly. You see, I'm his mother, too."

"No child can have more than two parents, Dr. Schoonover. It's biologically impossible."

"No, it isn't, Mr. Monte. I just told you that. Adam was the product of three parents. That's a documented, scientific fact."

Monte wished he could stop, crawl under something, and die. But if he cut off his cross now Ruth would simply go on with re-direct. And certainly he'd opened up a very large can of worms with his last few questions. Yet he still didn't know where Schoonover expected to go with the story. Whatever it was, whatever dangers lurked ahead, the prosecution's duty was clear: ask the next obvious question. He did.

"What is the basis for your statement that you are one of Adam's parents?"

"Simple, Mr. Monte." Schoonover's demeanor suddenly became patronizing. "The determinative biological factor in whether or not a parent-child relationship exists is the contribution, by an individual, of genetic material to the child. In Adam's case, to accomplish the result I wanted, I couldn't simply use the material in either the chimp ovum or the chimp sperm. It wasn't there. So I added human DNA to both. There's no sexual difference at that level, and naturally there was only one really convenient place to get it. I used my own. Therefore, it logically follows that I am Adam's parent, and it's only out of deference to my sex that he calls me 'Daddy'; 'Mommy' would be equally appropriate. And, since I am his only

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human parent, I thought it was appropriate that I should be the one to raise him. By the way, I consider Adam to be as human as I am."

Now, at last, Monte got the point. He was through. He could not go on. He had won every battle but this one, and this one cost him the war. "Pass the witness," he said.

Ruth stood. "I have no more witnesses, Your Honor. I do have a motion for directed verdict, however, after which I shall rest."

"Mr. McGill, take the jury out. Dr. Schoonover, you may step down. You're excused."

By now the jury was so good at the routine they didn't even wait for Ralph. He stood at the back of the courtroom and opened the door.

Ruth walked over to the prosecution table and handed Monte a copy of her motion. He took it without enthusiasm, and she continued on to where the clerk sat. The clerk file-stamped it, initialed it, and handed it up to the judge, who read it and signalled her to begin.

"Your Honor, the Court has now heard all the evidence in this case, and both sides have rested. The defendant would show the Court that the Government has utterly failed in its burden of proof, and in its obligation to demonstrate that a crime has been committed in the first place, much less that the defendant committed it.

"They have, of course, introduced testimony which tends to show that Adam is a person, and in that respect the defense entirely agrees. However, not all persons are constitutionally protected in their liberty. The amendment itself provides several exceptions to its effect—persons serving sentences for crimes, as a specific instance. There is another, so basic and so incontrovertible that it didn't need mention or explanation; namely, the relationship between parent and minor child. A parent unquestionably has the right to restrain a child's liberty and utilize his services free. That's been the law since the dawn of history.

"The evidence is uncontradicted. Dr. Schoonover is a parent, or at least a co-parent, of Adam. While it may be the first time the Earth has ever witnessed such an event, it is a biologic, scientific, and more importantly, a *legal* fact that they are mother-father and minor son. As Mr. Monte put it, Adam is literally Dr. Schoonover's Brain Child.

"Because that relationship exists, neither the relationship of master and slave, peon and padrone, or any other similar relationship can co-exist with it. If these forbidden relationships cannot and do not exist, then the crime charged cannot exist. All other arguments are moot, just as all other facts are irrelevant. There is nothing for the jury to decide, therefore the verdict must be the Court's, and since an essential element of the crime is missing the only verdict can be acquittal."

Ruth sat down.

"Mr. Monte, you may respond."

Monte didn't rise. He shook his head *no*.

"The court will direct the jury to find for the defendant. Bring them back again, Marshal."

With that there was a rush for the doors. The crowd of reporters half killed

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each other to get out of the building and get the news on the air.

"Love your bedroom, Delmar. I'll bet you do your own decorating." Ruth propped herself up on one elbow, punching the pillow up with her other arm. "Tell me, how do you feel about your lawyer now?"

Well, satisfied, and well satisfied. But now come we spend all our time in bed."

"It's good for you. Don't you like me?"

Sure, I do. And I want you to know I'm grateful, too. You sure got the job done. I'm off the hook; I can get back to work. Adam's asleep in his own bunk for the first time in three months, and the whole world's gotten interested in genetic engineering."

"See, now you can spare a little time for me. That was my plan all along."

I guess I'm just dense, Ruth. Your plan wasn't all that obvious to me. It looked like things were just happening, and I still don't see how you did it."

"Do you understand the law of gravity?"

No. Nobody does. But I can understand its effect."

"There's nothing magical about what I did, Delmar. It was a simple matter of picking the right thread, following it through the maze, and getting to the door I wanted. I knew what the rule was."

Huh?"

"The Constitution says that to be tried for a major federal crime, you have to be indicted by a Grand Jury. The indictment has to follow the statutory language that makes the conduct a crime. It has to allege you engaged in that conduct, and that when you did it you had the requisite criminal intent.

"The elements of slavery are: first, the restraint of a person; second, the involuntariness of the restraint; third, the presence of the intent to obtain that individual's services in violation of the law; and fourth, the absence of any legal justification. We call this the *corpus delicti*: the body of the crime.

"Knowing both the law and facts, I could start eliminating possibilities. There wasn't any sense in denying the restraint, or even the involuntary nature of the restraint. It would have been useless. Criminal intent was a possibility, but it probably wouldn't have gotten past the court's charge to the jury. They'd have been instructed to infer it from your acts.

"That left two possible escape routes. Remember, the prosecution had the burden of proof. Their case had to stand on its own merits proofwise. Every reasonable doubt as to guilt had to be resolved in your favor. Every essential element of the crime charged had to be proven under the same test. It's like the reaction the astronauts gave when asked how much organic material had to be removed from the holding tanks to produce potable water. Do you remember their answer?"

"Yes," Schoonover replied. "They said, all of it."

"Now you've got it. The DA, of course, was acutely aware I thought I'd found a defense, and he certainly didn't have any trouble deciding what it was. Any fool could see it; your only way out was to dehumanize the victim.

"Here I was with a situation abso-

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lutely brand new, factually. Nothing like it had ever happened in human history; here was a court being asked to decide if a human being could be guilty of enslaving a being who was absolutely unique to our age, and who might or might not be a person. Notice I said *person,* not *human*. The word 'person' can be defined; the word 'human' can't. Some pretty shrewd individuals have tried, including a guy name John W. Campbell, who used to edit a magazine call *Astounding*. In fact, I used his editorial in the September '59 issue to plan my cross of Mona Aikenhead.

"Anyway, Monte would expect me to deny Adam was a person; reasoning that way was natural. In fact, most lawyers would have considered that to be the only possible defense and stopped there. After all, it worked on blacks and Indians for several hundred years in cases where only the most bigoted jury could have denied their humanity.

"But I read the whole amendment, plus the statutes, plus the indictment, just like I'd never seen it before, and it occurred to me that there was something there that Monte hadn't seen because he didn't look. I almost told him about it then."

"What! Why would you have wanted to do that?"

"Because there might have been a dismissal of the indictment against you. You might not have had to stand trial."

"I see. You mean, I went through all this for nothing?"

"Of course not. And my reason was a good one. If he didn't buy it, Monte could still have gone ahead, and our defense would have been revealed. He'd have marched in a dozen experts to attack your status as a parent. I couldn't be 100% sure it would stand up.

"So I played his game—let him think he was right about our position. And he did what I expected. He put in the pictures, your articles, the testimony of Mona Aikenhead and Madelyn Hundin. Then there was his little trick with Adam. He knew as well as I did Cook probably wouldn't let Adam take the stand, but he wanted the jury to see him in an upset emotional state. All his strategy was designed to fortify the normal human tendency to humanize the rest of the Earth's animal life. People are used to teddy bears and such. The most widely recognized face on Earth belongs to Mickey Mouse.

"You asked me if Monte would have Adam marked as an exhibit. I knew he wouldn't do that. That'd help us dehumanize Adam and that wasn't in his plans. I planted the scent on the rabbit trail and Monte just sniffed along until he bumped his head on reality. It was a *ruse de guerre*. You see, Delmar, in law it's facts that count. Words are just used to pump adrenalin."

"How come he never caught on?"

"His ego wouldn't let him. All through the trial I was scared to death he would. But he's a prosecutor and he thinks like one. The prosecution's used to having a pat hand. They control who gets indicted, picking only cases they have a good chance of winning, and knowing they can deal most of these out on pleas. In your case, Monte probably figured I'd feel obliged to put on a show in order to justify what you're paying us; that I'd do that in any case to reap the publicity benefits for myself. It's not uncommon; we call it playing out the string. I'm

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sure Monte read me that way. Otherwise he'd have toughened up his proof—put on more witnesses—and the case would have lasted a couple of weeks like the papers were saying. He got the wrong answer because he asked himself the wrong question.

I played along, restricting my examination to questions in areas which would fortify his theory. I didn't actually care what anybody said; except you, that is. I would have been happy to stipulate to his entire case and agree in advance what everybody would say.

And I could always tell when he was in trouble. The ears never lie; they're like big, red warning lights. That's why we girls go to court with our hair down and why black lawyers are extra dangerous opponents.

It was all like Stalin's preliminary skirmishes around Rostov during the Russian Civil War. These didn't accomplish a thing except to convince the Whites he was on the ropes, so he could suck them into the trap at the Don bend. You know what happened after that, don't you?"

"No, but I can guess. Anyhow, what does it matter whether I know, as long as you do?"

"Sounds like you might be planning to keep me around, Delmar. I'm flattered."

"I've been thinking, Ruth. There's no reason why Adam should be an only child, is there? Or grow up without a real mother."

"Why Delmar, what a clever way to get at my DNA. The answer's yes; I mean no, there isn't. That was a proposal, wasn't it?"

"Uh-huh. This world is going to be rough on Adam; on me too. And a boy's best friend . . ."

"Is his lawyer. Delmar, I think you're catching on." ■

● (Medieval men) never for a moment doubted that the right question to ask was the question, "What practical use or what moral instruction did God intend for me when he created this creature or that?" If few ever troubled to see whether or not the toad, "ugly and venomous, yet wears a precious jewel in his head," that was simply because it seemed to them so inherently probable that he did. What reason other than the desire to teach man a useful lesson could God possibly have for cluttering his beautiful earth with creatures so repulsive?

Joseph Wood Krutch

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The Alternate View

THE SPACE WAR

Jerry Pournelle

Space offers mankind's only hope of a *long* future. If we are to survive for 100 billion years—and there's no known reason why we can't—then we must, of course, outlive the Earth and Sun.

We must also live through this century, which may shape the nature of our future. Will freedom survive into the third millennium? Will we? And has space a role in that?

There's been a recent rash of articles "proving" that space wars are impossible. The only rational strategic policies, it seems, are unilateral disarmament (UD) or Mutual Assured Destruction (MAD). Of course, the latter policy dooms us all if it fails, so there must be the implicit assumption that we won't *really* retaliate if attacked; thus MAD often reduces to UD—a fact well realized by many of those who "prove" that you can't defend yourself against ICBMs.

The arguments go this way: Space battle stations are absurd, because they're vulnerable. A space station—or any other military space system—will cost billions of dollars. Assume that its military value is great compared to its cost. An example would be the Global Positioning System (GPS) a system of navigation satellites that will allow aircraft, ships, trains, tanks, and individual soldiers instantly to determine precisely where they are to the nearest meter in three dimensions. It's estimated that this system can save multi-billions in fuel costs alone, simply by allowing precision navigation in any weather condition.

But if the system is worth many billions, its destruction must be worth something approaching that to a potential enemy; and for far less than multiple billions, any space installation can be attacked and destroyed. Thus it doesn't pay to build space weapons.

Ground defenses, on the other hand, fail because beam weapons effects can't penetrate atmosphere. Note that we "know" this only from theory—and that there are counter theories. The whole argument is up in the air, and I don't know of anyone who has final answers. Might preparatory beams "open a hole" in the atmosphere to allow the rest of the beam energy through? Ought we to bet the nation on the present theories?

One thing is certain: small effects can make a big difference. Example: In theory, radar should operate on line of sight only. The atmospheric refraction isn't all that large.

In practice, given that the atmosphere isn't uniform, the over-the-horizon effects are very great. British radar made use of that in the Battle of Britain, and

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it was decisive: the entire (small) RAF was able to engage each Luftwaffe attack. The Germans never did catch wise.

In later years the British used VHF beams—about the frequency of your television set—to guide bombers to Berlin. The equipment was supposed to be destroyed if the airplane went down, but one set got captured intact. The Germans detailed a commission of scientists to figure out what the set was for.

After the war, a member of the commission told the Allies that they concluded it must be a training device. They could easily determine the frequency, and they "knew" no beam on that frequency could reach from Britain to Berlin.

My conclusion is that we can't afford to ignore any possible theatre of conflict, and as Possony and I stated in *The Strategy of Technology*, technological warfare—in this case, use of space technology—can be both bloodless and decisive. And sometimes it can help your economy with new inventions. . . .

Some of those "proving" that space war is impossible sincerely believe what they're saying, but what can we make of arguments like those presented by Gerald Steinberg in the October 1981 issue of *Technology Review*? Steinberg concludes that orbital weapons are useless, and bases his conclusion on such arguments as, "Unlike bombers and missiles directly launched by pilots and ground officers, satellites carrying nuclear weapons would be controlled remotely. They would also be subject to various forms of interference, making them unreliable in a crisis. In addition, satellites are subject to technical failures that lead to unscheduled and uncontrollable reentry. Problems enough were caused when the U.S. Skylab landed in a remote section of Australia . . ."

This in a technical magazine, from an author who has been a consultant to the Department of Energy and the congressional Office of Technology Assessment. (He is now a post-doctoral fellow in the Arms-Control Program at M.I.T.'s Center for International Studies.)

I am not a strong advocate of orbital bombs, but my objections are strategic, not fantasy. Obviously it is possible to put satellites in orbits high enough to avoid "unscheduled and uncontrollable reentry." Surely Dr. Steinberg knows this? And if he doesn't, shouldn't the editors of *Technology Review*, a publication of the Alumni Association of the Massachusetts Institute of Technology (and actually published on campus), have been able to find *someone* to give them competent advice on undergraduate space science?

Unfortunately, the Steinberg article is fairly typical of the quality of strategic debate, which is a pity, because the subject is vastly important.

So far, all the space wars have taken place on paper. Perhaps most important has been the battle of the budget, to see what we can save for the space program.

You'd think those battle lines would be cleanly drawn, but they're not. There are:

(1) The administration, which is itself divided into (1.1) the President, and (1.2) the Office of Management and Budget. President Reagan is a space

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enthusiast, but he has delegated most of the budget decision authority to OMB. David Stockman at OMB *likes* space, but is determined to keep the total budget low; and for political reasons doesn't want *anyone* to get special privileges and exemptions from cuts.

(2) The Congress, which wouldn't really mind putting more into space, but isn't about to get into a big fight with OMB over NASA.

Both the above groups see space as important and popular. They didn't always, but the letter and telephone campaigns of space enthusiasts have convinced both Congress and the administration that the space program has a constituency.

Unfortunately, neither Congress nor the administration sees space as a primary gut issue. They're sure the space program isn't sufficiently important to enough people to change the results of a presidential election, and probably isn't important enough to make a difference in a congressional campaign. That latter isn't so certain, and thus congresscritters are more influenced by pro-space mail than anyone else.

(3) We have the enemies, typified by Senator Proxmire of Wisconsin. Proxmire is very crafty. His pitch on planetary exploration is that "The planets will be there a long time, chuckle, chuckle." He is, after all, only trying to save the taxpayers some money (except for dairy subsidies, which he works to get increased despite the mountains of surplus butter the U.S. has rotting away in caves and caverns).

Proxmire gives "Golden Fleece Awards" to those whom he claims are using public money for inappropriate purposes. It isn't often noted that he gives them only to fairly small programs; he isn't willing to take on a *big* constituency with real power. He perceives space as helpless. . . .

(3.1) Other enemies, including the "How can you spend all that money in space when it's needed here on Earth?" group. The reasons it's needed on Earth seldom include leaving the money in the pockets of taxpayers.

(3.2) The anti-technology crowd, including those who want us to develop any energy system so long as it can't possibly work.

(4) The space advocates.

This is the group you'd think would be most coherent. Alas, it's not. Indeed, the internecine wars within the space community may be responsible for the sad state of space investment.

(4.1) The Manned Space Program Advocates, typified by the L-5 Society (plug: 1060 E. Elm, Tucson AZ 85719, $20/year). It itself is divided on the question of how much government involvement is good for space, although it's safe to say that nearly everyone in L-5 prefers private development to government domination. (I recently got a letter asking if I wanted the resources of the solar system owned by The Phone Company. I thought about that a while and concluded that I don't, but I prefer Telco to the Post Office.)

The Manned Space group wants to assure access to space; this means that scarce space resources should go to develop new space technology, not to fly science missions.

(4.2) The Unmanned Advocates, typified by a recent editorial in the Planetary Society publication. Just as the

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manned space group isn't against planetary probes, the unmanned people aren't against man-in-space, but they are afraid that the limited space resources will all go to develop new technology, and nobody will fly missions, and there won't be any new planetary science, so they want scarce resources to go into building unmanned boosters and probes.

Now if the space advocates could keep their battles private, things would be all right, but that doesn't happen. Sometimes the arguments get quite heated—and lo! there stands listening one of Mr. Stockman's people, sharp pencil in hand, ready to use each group's arguments against the other. The conclusion reached in official Washington is that the space community is divided.

It gets worse, because the space advocates are divided along other lines, too. Within the manned space community there are sharp divisions over the emphasis to be given to military programs, and the unmanned community is no more united on the question. Dr. Carl Sagan, president of the Planetary Society, is vehemently anti-military, but there are also USAF generals who believe any manned space system to be so vulnerable as to be worthless.

So. The space advocates have done a lot of good. A congressional administrative assistant recently told me that, because of the letter-writing campaigns of the pro-space groups, a congressman typically has to spend as much as ten minutes a month thinking about space, whereas two years ago he never thought about it at all. And certainly we have to continue what we're doing.

But we could do a lot more, if we'd get together.

Congressman Newt Gingrich, who is, I think, the only historian in Congress, is one of the best friends the space program ever had. He tells the story of a time in England when the Liberals wanted to build two ships, while the Conservatives wanted to build four. Eventually they compromised on six.

NASA has asked the Administration for less than 1% of the national budget, not enough to develop a strong space program; not enough to satisfy any of the space advocates. The Office of Management and Budget wants to cut that still further.

The result can be war between the manned and unmanned advocates. Shall we build a new line of expendable boosters (like Thor and Atlas)? Shall we put the money into more space shuttles? Should we put up a space station, or send a probe to Jupiter? Do we look at the lunar poles (for water ice) or go examine an asteroid, and if we send out an asteroid mission, shall it be manned or unmanned?

Serious questions, and we can't do all of them, not on what OMB is offering, and not on what NASA is asking for.

So. I propose that the space community compromise. OMB wants to give us $6 billion. NASA wants $7 billion. Let's compromise on $9 billion. And make it stick.

To that end, I've been meeting with leaders of space organizations. We're trying to work out a program we can all support, so that we can speak with one voice. By the time this is in print we may have done that.

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The rest is up to you. You have to tell them in Washington that we really mean it.

It's not an unwelcome message. Look: the President's economic program rests, at bottom, on expectations. If people really believe in the future, they'll take their money out of non-productive investments like gold and silver and put it into industry and research. If enough people do that, the economy can turn around in an instant; but it all rests on belief. The President's message is clear: "Invest in the Future."

OK. But the space program *is* investment in the future; and if the government doesn't believe in the future, why the hell should anyone else?

So. Let's tell them. We want a *real* space program; one that shows real faith in the future. Back in Washington they don't believe we have the power to change the results of an election. I think they're wrong. Let's prove it. ■

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SCIENCE, FICTION.

Arlan Keith Andrews, Sr.

Research Report Says	What It Really Means
[illegible] the feature fails to show	*Hustler* and *Playboy* didn't say.
[illegible] shown that	Somebody once told me.
It is [illegible] believed that	A guy in a bar once agreed with me.
It is unrealized knowledge that	Two guys in a bar once agreed with me.
It is universally accepted that	The bartender agreed, too!
Of great theoretical importance	I need a dissertation topic.
Of great practical importance	I need a job.
Technical difficulties postponed the	The engineers screwed up.
A scientific breakthrough occurred	The engineers didn't screw up.
Typical results confirm	Nothing exploded.
Data spread was well within expected limits	Something did *melt*.
Experimental results agreed with the projected outcome	My French curve fit.
A few anomalous data points were attributable to instrumental error	My French curve didn't fit.
Agreement with predicted results is:	
Excellent	What the director wanted.
Good	What the team wanted.
Fair	What the technicians wanted.
Poor	What the truth is.
Data have been normalized	You wouldn't believe the numbers I got.
Dimensionless parameter plots show	Nobody else would, either.
Statistical analyses reveal	I had to lie a bit.
Data processing procedures were implemented	I had to lie a lot.
Results were generally positive	I got a raise.
Significant progress was accomplished	I got a good raise.
The state of the art was advanced	I got promoted.
Valuable assistance was provided by	He stayed out of the lab.
Invaluable suggestions were provided by	He was the research director.
Further investigation is warranted	I need another grant. ■

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THE ANALYTICAL LABORATORY

It's that time of year again, when you, the readers, evaluate what we published last year and we publish your opinions. Our thanks to all who voted on our 1981 stories, articles, and covers.

Scoring starts by counting a first-place vote as three points, a second as two, and a third as one. The final score reported here is normalized to a scale of 0 to 10 by dividing an item's total points by the number it would have had if everybody ranked it first, and multiplying that number by 10. Thus the higher the score, the more popular the item.

Comparing the scores *within a category* gives a good idea of relative popularity, but you can't compare numbers in one category with those in another. The more items there are in a category, the lower scores will run. For example, a score of 3.00 would be extremely high for a short story and unattainably low for a serial. For comparison, I've put in parentheses after each category heading the score each item in that group would have received had all been equally popular.

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[illegible] start at 40,000, [illegible] that long we would [illegible] anyway.) We still group novelettes and novellas together for our own voting purposes as we always have, to keep the categories from being so small.

Here are the results:

SERIALS (6.67)
1. *Dawn*, Dean McLaughlin (6.69)
2. *Shuttle Down*, Lee Correy (6.23)
3. *Dragonstar*, David Bischoff & Thomas F. Monteleone (6.06)

NOVELLAS AND NOVELETTES (0.74)
1. "Emergence," David R. Palmer (3.31)
2. "Petals of Rose," Marc Stiegler (2.13)
3. "The Saturn Game," Poul Anderson (1.55)
4. "Guardians," George R. R. Martin (1.51)
5. "The Tides of Kithrup," David Brin (1.34)

SHORT STORIES (0.53)
1. "Green Winter," F. Paul Wilson (1.70)
2. "Absent Thee From Felicity Awhile," Somtow Sucharitkul (1.48)
3. "Collector's Item," Barry B. Longyear (1.44)
4. "The Pacifists," Jayge Carr (1.16)
5. "Misfits," Edward A. Byers (1.14)

FACT ARTICLES (1.54)
1. "Extraterrestrial Zoology," Dr. Robert A. Freitas, Jr. (3.56)
2. "Base Eight Arithmetic, Meteors, and Man," John Gribbin (2.54)
3. "Mars in 1995!" Bob Parkinson & David Hardy (2.43)
4. "Mercury's Missing Divot," J. E. Enever (1.59)

COVERS (1.54)
1. February: Vincent di Fate, for "The Saturn Game" (5.53)
2. June: David Hardy, for "Mars in 1995!" (2.67)
3. March 2: Paul Lehr, for "Paradise Misplaced" (2.65)
4. January: Rick Sternbach, for "Mercury's Missing Divot" (1.86)

One note in closing: your feedback is very important to us and ultimately to you (even on serials!) because it influences what we buy in the future. The more votes we have, the better that influence will reflect your actual tastes. The numbers this year were not quite as high as I'd hoped, but you'll get another chance next year. When the time comes, please take a few minutes to tell us what you liked or didn't. It will help us both—really!

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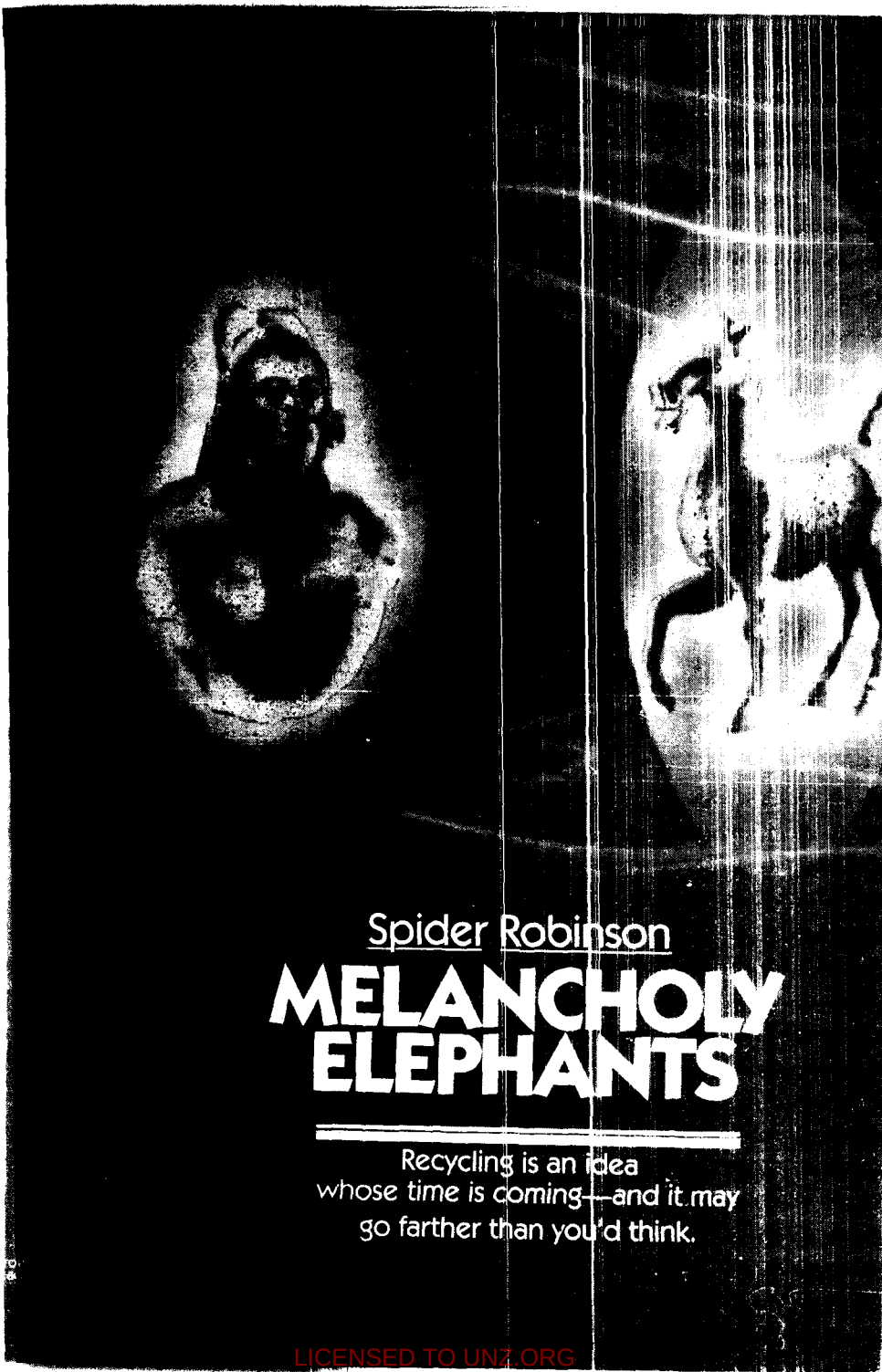

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She sat zazen, concentrating on not concentrating, until it was time to prepare for the appointment. Sitting *seemed* to produce the usual serenity, put everything in perspective. Her hand did not tremble as she applied her makeup; tranquil features looked back at her from the mirror. She was mildly surprised, in fact, at just how calm she was, until she got out of the hotel elevator at the garage level and the mugger made his play. She killed him instead of disabling him. Which was obviously not a measured, balanced action—the official fuss and paperwork could make her late. Annoyed at herself, she stuffed the corpse under a shiny new Westinghouse roadable whose owner she knew to be in Luna, and continued on to her own car. This would have to be squared later, and it would cost. No help for it—she fought to regain at least the semblance of tranquility as her car emerged from the garage and turned north.

Nothing must interfere with this meeting, or with her role in it.

Dozens of man-years and God knows how many dollars, she thought, *funneling down to perhaps a half hour of conversation. All the effort, all the hope. Insignificant on the scale of the Great Wheel, of course . . . but when you balance it all on a half hour of talk, it's like balancing a stereo cartridge on a needlepoint: It only takes a gram or so of weight to wear out a piece of diamond. I must be harder than diamond.*

Rather than clear a window and watch Washington, D.C., roll by beneath her car, she turned on the television. She absorbed and integrated the news, on the chance that there might be some late-breaking item she could turn to her advantage in the conversation to come; none developed. Shortly the car addressed her: "Grounding, ma'am. I.D. eyeball request." When the car landed, she cleared and then opened her window, presented her pass and I.D. to a Marine in dress blues, and was cleared at once. At the Marine's direction she re-opaqued the window and surrendered control of her car to the house computer, and when the car parked itself and powered down she got out without haste. A man she knew was waiting to meet her, smiling.

"Dorothy, it's good to see you again."

"Hello, Phillip. Good of you to meet me."

"You look lovely this evening."

"You're too kind."

She did not chafe at the meaningless pleasantries. She needed Phil's support, or she might. But she did reflect on how many, many sentences have been worn smooth with use, rendered meaningless by centuries of repetition. It was by no means a new thought.

"If you'll come with me, he'll see you at once."

"Thank you, Phillip." She wanted to ask what the old man's mood was, but knew it would put Phil in an impossible position.

"I rather think your luck is good; the old man seems to be in excellent spirits tonight."

She smiled her thanks, and decided that if and when Phil got around to making his pass she would accept him.

The corridors through which he led her then were broad and high and long; the building dated back to a time of cheap power. Even in Washington, few others would have dared to live in such

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an energy-wasteful environment. The extremely spare decor reinforced the impression created by the place's very dimensions: bare space from carpet to ceiling, broken approximately every forty meters by some exquisitely simple object d'art of at least a megabuck's value, appropriately displayed. An unadorned, perfect, white porcelain bowl, over a thousand years old, on a rough cherrywood pedestal. An arresting color photograph of a snow-covered country road, silk-screened onto stretched silver foil; the time of day changed as one walked past it. A crystal globe, a meter in diameter, within which danced a hologram of the immortal Shara Drummond: since she had ceased performing before the advent of holo technology, this had to be an expensive computer reconstruction. A small sealed glassite chamber containing the first vacuum-sculpture ever made, Nakagawa's legendary Starstone. A visitor in no hurry could study an object at leisure, then walk quite a distance in undistracted contemplation before encountering another. A visitor in a hurry, like Dorothy, would not *quite* encounter peripherally astonishing stimuli often enough to get the trick of differing them out. Each nagged at her attention, intruded on her thoughts; they were distracting both intrinsically and as a reminder of the enormity of their owner's wealth. To ignore it: the man in his own home, which—at leisure or in haste—was to be introduced. She knew the effect was intentional, and could not transcend it; this affront itself, which irritated her. She struggled for detachment.

At the end of the seemingly endless corridor was an elevator. Phillip handed her into it, punched a floor button without giving her a chance to see which one, and stepped back into the doorway. "Good luck, Dorothy."

"Thank you, Phillip. Any topics to be sure and avoid?"

"Well . . . don't bring up hemorrhoids."

"I didn't know one could."

He smiled. "Are we still on for lunch Thursday?"

"Unless you'd rather make it dinner."

One eyebrow lifted. "And breakfast?"

She appeared to consider it. "Brunch," she decided. He half-bowed and stepped back.

The elevator door closed and she forgot Phillip's existence.

Sentient beings are innumerable; I vow to save them all. The deluding passions are limitless; I vow to extinguish them all. The truth is limitless; I—

The elevator door opened again, truncating the Vow of the Boddhisatva. She had not felt the elevator stop—yet she knew that she must have descended at least a hundred meters. She left the elevator.

The room was larger than she had expected; nonetheless the big powered chair dominated it easily. The chair also seemed to dominate—at least visually—its occupant. A misleading impression, as he dominated all this massive home, everything in it and, to a great degree, the country in which it stood. But he did not look like much.

A scent symphony was in progress, the cinnamon passage of Bulachevski's "Childhood." It happened to be one of

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her personal favorites, and this encouraged her.

"Hello, Senator."

"Hello, Mrs. Martin. Welcome to my home. Forgive me for not rising."

"Of course. It was most gracious of you to receive me."

"It is my pleasure and privilege. A man my age appreciates a chance to spend time with a woman as beautiful and intelligent as yourself."

"Senator, how soon do we start talking to each other?"

He raised that part of his face which had once held an eyebrow.

"We haven't *said* anything yet that is true. You do not stand because you cannot. Your gracious reception cost me three carefully hoarded favors and a good deal of folding cash. More than the going rate; you are seeing me reluctantly. You have at least eight mistresses that I know of, each of whom makes me look like a dull matron. I concealed a warm corpse on the way here because I dared not be late; my time is short and my business urgent. Can we begin?"

She held her breath and prayed silently. Everything she had been able to learn about the Senator told her that this was the correct way to approach him. But was it?

The mummy-like face fissured in a broad grin. "Right away. Mrs. Martin, I like you and that's the truth. My time is short, too. What do you want of me?"

"Don't you know?"

"I can make an excellent guess. I hate guessing."

"I am heavily and publicly committed to the defeat of S. 4217896."

"Yes, but for all I know you might have come here to sell out."

"Oh." She tried not to show her surprise. "What makes you think that possible?"

"Your organization is large and well-financed and fairly efficient, Mrs. Martin, and there's something about it I don't understand."

"What is that?"

"Your objective. Your arguments are weak and implausible, and whenever this is pointed out to one of you, you simply keep on pushing. Many times I have seen people take a position without apparent logic to it—but I've always been able to see the logic if I kept on looking hard enough. But as I see it, S. '896 would work to the clear and lasting advantage of the group you claim to represent, the artists. There's too much intelligence in your organization to square with your goals. So I have to wonder what you *are* working for, and why. One possibility is that you're willing to roll over on this copyright thing in exchange for whatever it is that you *really* want. Follow me?"

"Senator, *I am* working on behalf of all artists—and in a broader sense—"

He looked pained, or rather, more pained. ". . . 'for all mankind,' oh my *God*, Mrs. Martin, really now."

"I *know* you have heard that countless times, and probably said it as often." He grinned evilly. "This is one of those rare times when it happens to be true. I believe that if S. '896 does pass, our species will suffer significant trauma."

He raised a skeletal hand, tugged at his lower lip. "Now that I have ascertained where you stand, I believe I can

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save you a good deal of money. By concluding this audience, and seeing that the squeeze you paid for half an hour of my time is refunded pro rata."

Her heart sank, but she kept her voice even. "Without even hearing the hidden logic behind our arguments?"

"It would be pointless and cruel to make you go into your spiel, ma'am. You see, I cannot help you."

She wanted to cry out, and savagely refused herself permission. *Control,* whispered a part of her mind, while another part shouted that a man such as this did not lightly use the words. "I cannot." But he *had* to be wrong. Perhaps the sentence was only a bargaining gambit.

No sign of the internal conflict showed; her voice was calm and measured. "Sir, I have not come here to lobby. I simply wanted to inform you personally that our organization intends to make a no-strings campaign donation in the amount of—"

"Mrs. Martin, please! Before you commit yourself, I repeat, I cannot help you. Regardless of the sum offered."

"Sir, it is substantial."

"I'm sure. Nonetheless it is insufficient."

She knew she should not ask. "Senator, why?"

He frowned, a frightening sight. "Look," she said, the desperation almost showing through now, "keep the pro forma part of it; buys me an answer! Until I'm convinced that my mission is utterly hopeless, I must not abandon it, and—and you're the quickest way to get me out of your office. Your scanners have searched me quite thoroughly; you know that I'm not abscamming you."

Still frowning, he nodded. "Very well. I cannot accept your campaign donation because I have already accepted one from another source."

Her very worst secret fear was realized. He had already taken money from the other side. The one thing any politician must do, no matter how powerful, is stay bought. It was all over.

All her panic and tension vanished, to be replaced by a sadness so great and so pervasive that for a moment she thought it might literally stop her heart.

Too late! Oh my darling, I was too late!

She realized bleakly that there were too many people in her life, too many responsibilities and entanglements. It would be at least a month before she could honorably suicide.

"—you all right, Mrs. Martin?" the old man was saying, sharp concern in his voice.

She gathered discipline around her like a familiar cloak. "Yes, sir, thank you. Thank you for speaking plainly." She stood up and smoothed her skirt. "And for your—"

"Mrs. Martin."

"—gracious hos— Yes?"

"Will you tell me your arguments? Why shouldn't I support '896?"

She blinked sharply. "You just said it would be pointless and cruel."

"If I held out the slightest hope, yes, it would be. If you'd rather not waste your time, I will not compel you. But I am curious."

"Intellectual curiosity?"

He seemed to sit up a little straighter—surely an illusion, for a prosthetic spine is not motile. "Mrs.

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Martin, I happen to be committed to a course of action. That does not mean I don't care whether the action is good or bad."

"Oh." She thought for a moment. "If I convince you, you will not thank me."

"I know. I saw the look on your face a moment ago, and . . . it reminded me of a night many years ago. Night my mother died. If you've got a sadness that big, and I can take on a part of it, I should try. Sit down."

She sat.

"Now tell me: What's so damned awful about extending copyright to meet the realities of modern life? Customarily I try to listen to both sides before accepting a campaign donation—but this seemed so open and shut, so straightforward . . ."

"Senator, that bill is a short-term boon, to some artists—and a long-term disaster for all artists, on Earth and off."

" 'In the long run, Mr. President—',' he began, quoting Keynes.

"—we are some of us still alive," she finished softly and pointedly. "Aren't we? You've put your finger on part of the problem."

"What is this disaster you speak of?" he asked.

"The worst psychic trauma the race has yet suffered."

He studied her carefully and frowned again. "Such a possibility is not even hinted at in your literature or materials."

"To do so would precipitate the trauma. At present only a handful of people know, even in my organization. I'm telling *you* because you asked, and because I am certain that you are the only person recording this conversation. I'm betting that you will wipe the tape."

He blinked, and sucked at the memory of his teeth. "My, my," he said mildly. "Let me get comfortable." He had the chair recline sharply and massage his lower limbs; she saw that he could still watch her by overhead mirror if he chose. His eyes were closed. "All right, go ahead."

She needed no time to choose her words. "Do you know how old art is, Senator?"

"As old as man, I suppose. In fact, it may be part of the definition."

"Good answer," she said. "Remember that. But for all present-day intents and purposes, you might as well say that art is a little over 15,600 years old. That's the age of the oldest surviving artwork, the cave paintings at Lascaux. Doubtless the cave-painters sang, and danced, and even told stories—but these arts left no record more durable than the memory of a man. Perhaps it was the story tellers who next learned how to preserve their art. Countless more generations would pass before a workable method of musical notation was devised and standardized. Dancers only learned in the last few centuries how to leave even the most rudimentary record of their art.

"The racial memory of our species has been getting longer since Lascaux. The biggest single improvement came with the invention of writing: our memory-span went from a few generations to as many as the Bible has been around. But it took a massive effort to sustain a memory that long; it was difficult to hand-copy manuscripts faster than bar-

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barians, plagues, or other natural disasters could destroy them. The obvious solution was the printing press: to make and disseminate so many copies of a manuscript or art work that *some* would survive any catastrophe.

"But with the printing press a new idea was born. Art was suddenly mass-marketable, and there was money in it. Writers decided that they should own the right to copy their work. The notion of copyright was waiting to be born.

"Then in the last hundred and fifty years came the largest quantum jumps in human racial memory. Recording technologies. Visual: photography, film, video, Xerox, holo. Audio: low-fi, hi-fi, stereo, and digital. Then computers, the ultimate in information storage. Each of these technologies generated new art forms, and new ways of preserving the ancient art forms. And each required a reassessment of the idea of copyright.

"You know the system we have now, unchanged since the mid twentieth-century. Copyright ceases to exist fifty years after the death of the copyright holder. But the size of the human race has increased drastically since the 1900s—and so has the average human lifespan. Most people in developed nations now expect to live to be a hundred and twenty; you yourself are considerably older. And so, naturally, S. '896 now seeks to extend copyright into perpetuity."

"Well," the senator interrupted, "what is *wrong* with that? Should a man's work cease to be his simply because he has neglected to keep on breathing? Mrs. Martin, you yourself will be wealthy all your life if that bill passes. Do you truly wish to give away your late husband's genius?"

She winced in spite of herself.

"Forgive my bluntness, but that is what I understand *least* about your position."

"Senator, if I try to hoard the fruits of my husband's genius, I may cripple my race. Don't you see what perpetual copyright implies? It is perpetual racial memory! That bill will give the human race an elephant's memory. *Have you ever seen a cheerful elephant?*"

He was silent for a time. Then: "I'm still not sure I understand the problem."

"Don't feel bad, sir. The problem has been directly under the nose of all of us, for at *least* eighty years, and hardly anyone has noticed."

"Why is that?"

"I think it comes down to a kind of innate failure of mathematical intuition, common to most humans. We tend to confuse any sufficiently high number with infinity."

"Well, anything above ten to the eighty-fifth might as well be infinity."

"Beg pardon?"

"Sorry—I should not have interrupted. That is the current best-guess for the number of atoms in the Universe. Go on."

She struggled to get back on the rails. "Well, it takes a lot less than that to equal 'infinity' in most minds. For millions of years we looked at the ocean and said, 'That is infinite. It will accept our garbage and waste forever.' We looked at the sky and said, 'That is infinite; it will hold an infinite amount of smoke.' We *like* the idea of infinity. A problem with infinity in it is easily solved. How long can you pollute a

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planet infinitely large? Easy: forever. Stop thinking.

"Then one day there are so many of us that the planet no longer seems infinitely large.

"So we go elsewhere. There are infinite resources in the *rest* of the solar system, aren't there? I think you are one of the few people alive wise enough to realize that there are *not* infinite resources in the solar system, and sophisticated enough to have included that awareness in your plans."

The senator now looked troubled. He sipped something from a straw. "Relate all this to your problem."

"Do you remember a case from about eighty years ago, involving the song 'My Sweet Lord' by George Harrison?"

"Remember it? I did research on it. My firm won."

"Your firm convinced the court that Harrison had gotten the tune for that song from a song called 'He's So Fine,' written over ten years earlier. Shortly thereafter Yoko Ono was accused of stealing 'You're My Angel' from the classic 'Makin' Whoopee,' written more than thirty years earlier. Chuck Berry's estate eventually took John Lennon's estate to court over 'Come Together.' Then in the late '80s the great Plagiarism Plague *really* got started in the courts. From then on it was open season on popular composers, and still is. But it really hit the fan at the turn of the century, when Brindle's *Ringsong* was shown to be 'substantially similar' to one of Corelli's concertos.

"There are eighty-eight notes. One hundred and seventy-six, if your ear is good enough to pick out quarter tones. Add in rests and so forth, different time signatures. Pick a figure for maximum number of notes a melody can contain. I do not know the figure for the maximum possible number of melodies—too many variables—but I am sure it is quite high.

"*I am certain that it is not infinity.*

"For one thing, a great many of those possible arrays of eighty-eight notes will not be perceived as music, as melody, by the human ear. Perhaps more than half. They will not be hummable, whistleable, listenable—some will be actively unpleasant to hear. Another large fraction will be so similar to each other as to be effectively identical: if you change three notes of the Moonlight Sonata, you have not created something new.

"I do not know the figure for the maximum number of discretely appreciable melodies, and again I'm certain it is quite high, and again I am certain that it is not infinity. There are sixteen billion of us alive, Senator, more than all the people that have ever lived. Thanks to our technology, better than half of us have no meaningful work to do; fifty-four percent of our population is entered on the tax rolls as artists. Because the synthesizer is so cheap and versatile, a majority of those artists are musicians, and a great many are composers. Do you know what it is like to be a composer these days, Senator?"

"I know a few composers."

"Who are still working?"

"Well . . . three of 'em."

"How often do they bring out a new piece?"

Pause. "I would say once every five years on the average. Hmmm. Never thought of it before, but—"

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"Did you know that at present two out of every five copyright submissions to the Music Division are rejected on the first computer search?"

The old man's face had stopped registering surprise, other than for histrionic purposes, more than a century before; nonetheless, she knew she had rocked him. "No, I did not."

"Why would you know? Who would talk about it? But it is a fact nonetheless. Another fact is that, when the increase in number of working composers is taken into account, the *rate* of submissions to the Copyright Office is decreasing significantly. There are more composers than ever, but their individual productivity is declining. Who is the most popular composer alive?"

"I suppose that Vachandra fellow."

"Correct. He has been working for a little over fifty years. If you began now to play every note he ever wrote, in succession, you would be done in twelve hours. Wagner wrote well over sixty hours of music—the Ring alone runs twenty-one hours. The Beatles—essentially two composers—produced over twelve hours of original music in *less than ten years*. Why were the greats of yesteryear so much more prolific?

"*There were more enjoyable permutations of eighty-eight notes for them to find.*"

"Oh my," the senator whispered.

"Now go back to the 1970s again. Remember the *Roots* plagiarism case? And the dozens like it that followed? Around the same time a writer named van Vogt sued the makers of a successful film called *Alien*, for plagiarism of a story written forty years earlier. Two other writers named Bova and Ellison sued a television studio for stealing a series idea. All three collected.

"That ended the legal principle that one does not copyright *ideas* but *arrangements of words*. The number of word-arrangements is finite, but the number of *ideas* is *much* smaller. Certainly, they can be retold in endless ways—*West Side Story* is a brilliant reworking of *Romeo and Juliet*. But it was only possible because *Romeo and Juliet* was in the public domain. Remember too that of the finite number of stories that can be told, a certain number will be *bad stories*.

"As for visual artists—well, once a man demonstrated in the laboratory an ability to distinguish between eighty-one distinct shades of color accurately. I think that's an upper limit. There is a maximum amount of information that the eye is capable of absorbing, and much of that will be the equivalent of noise—"

"But . . . but . . ." This man was reputed never to have hesitated in any way under any circumstances. "But there'll always be change . . . there'll always be new discoveries, new horizons, new social attitudes, to infuse art with new—"

"Not as fast as artists breed. Do you know about the great split in literature at the beginning of the twentieth century? The mainstream essentially abandoned the Novel of Ideas after Henry James, and turned its collective attention to the Novel of Character. They had sucked that dry by mid-century, and they're still chewing on the pulp today. But meanwhile a small group of writers, desperate for something new to write

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about, for a new story to tell, invented a new genre called science fiction. They mined the future for ideas. The infinite future—like the infinite coal and oil and copper they had then too. In less than a century they had mined it out; there hasn't been a genuinely original idea in science fiction in over fifty years. Fantasy has always been touted as the 'literature of infinite possibility'—but there is even a theoretical upper limit to the 'meaningfully impossible,' and we are fast reaching it."

"We can create new art forms," he said.

"People have been trying to create new art forms for a long time, sir. Almost all fell by the wayside. People just didn't like them."

"We'll *learn* to like them. Damn it, we'll have to."

"And they'll help, for a while. More new art forms have been born in the last two centuries than in the previous million years—though none in the last fifteen years. Scent-symphonies, tactile sculpture, kinetic sculpture, zero-gravity dance—they're all rich new fields, and they are generating mountains of new copyrights. Mountains of finite size. The ultimate bottleneck is this: that *we have only five senses with which to apprehend art, and that is a finite number*. Can I have some water, please?"

"Of course." The old man appeared to have regained his usual control, but the glass which emerged from the arm of her chair contained apple juice. She ignored this and continued.

"But that's not what I'm afraid of, Senator. The theoretical heat-death of artistic expression is something we may never really approach in fact. Long before that point, the game will collapse."

She paused to gather her thoughts, sipped her juice. A part of her mind noted that it harmonized with the recurrent cinnamon motif of Bulachevski's scent-symphony, which was still in progress.

"Artists have been deluding themselves, for centuries, with the notion that they create. In fact they do nothing of the sort. They discover. Inherent in the nature of reality are a number of combinations of musical tones that will be perceived as pleasing by a human central nervous system. For millennia we have been discovering them, implicit in the universe—and telling ourselves that we 'created' them. To create implies infinite possibility, to discover implies finite possibility. As a species I think we will react poorly to having our noses rubbed in the fact that we are discoverers and not creators."

She stopped speaking and sat very straight. Unaccountably her feet hurt. She closed her eyes, and continued speaking.

"My husband wrote a song for me, on the occasion of our fortieth wedding anniversary. It was our love in music, unique and special and intimate, the most beautiful melody I ever heard in my life. It made him so happy to have written it. Of his last ten compositions he had burned five for being derivative, and the others had all failed of copyright clearance. But this was fresh, special—he joked that my love for him had inspired him. The next day he submitted it for clearance, and learned that it had been a popular air during his early childhood, and had already been unsuccessfully

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submitted fourteen times since its original registration. A week later he burned all his manuscripts and working tapes and killed himself."

She was silent for a long time, and the senator did not speak.

"Ars longa, vita brevis," she said at last. "There's been comfort of a kind in that for thousands of years. But art is long, not infinite. The Magic goes away. One day we will *use it up*—unless we can learn to recycle it like any other finite resource." Her voice gained strength. "Senator, that bill has to fail, if I have to take you on to do it. Perhaps I can't win—but I'm going to fight you! A copyright must not be allowed to last more than fifty years—after which it should be flushed from the memory banks of the Copyright Office. We need selective voluntary amnesia, if Discoverers of Art are to continue to work without psychic damage. Facts should be remembered—but dreams?" She shivered. "Dreams should be forgotten when we wake. Or one day we will find ourselves unable to sleep. Given eight billion artists with effective working lifetimes in excess of a century, we can no longer allow individuals to own their discoveries in perpetuity. We must do it the way the human race did it for a million years—by forgetting, and rediscovering. Because one day, the infinite number of monkeys will have nothing else to write *except* the complete works of Shakespeare. And they would probably rather not *know* that when it happens."

Now she was finished, nothing more to say. So was the scent-symphony, whose last motif was fading slowly from the air. No clock ticked, no artifact hummed. The stillness was complete, for perhaps half a minute.

"If you live long enough," the senator said slowly at last, "there is nothing new under the sun." He shifted in his great chair. "If you're lucky, you die sooner than that. I haven't heard a new dirty joke in fifty years." He seemed to sit up straight in his chair. "I will kill S. 4217896."

She stiffened in shock. After a time, she slumped slightly and resumed breathing. So many emotions fought for ascendancy that she barely had time to recognize them as they went by. She could not speak.

"Furthermore," he went on, "I will not tell anyone why I'm doing it. It will begin the end of my career in public life, which I did not ever plan to leave, but you have convinced me that I must. I am both . . . glad, and—" His face tightened with pain— "and *bitterly* sorry that you told me why I must."

"So am I, sir," she said softly, almost inaudibly.

He looked at her sharply. "Some kinds of fight, you can't feel good even if you win them. Only two kinds of people take on fights like that: fools, and remarkable people. I think you are a remarkable person, Mrs. Martin."

She stood, knocking over her juice. "I wish to God I were a fool," she cried, feeling her control begin to crack at last.

"Dorothy!" he thundered.

She flinched as if he had struck her. "Sir?" she said automatically.

"Do *not* go to pieces! That is an order. You're wound up too tight; the pieces might not go back together again."

"So what?" she asked bitterly.

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He was using the full power of his voice now, the voice which had stopped at least one war. "So how many friends do you think a man my age has *got*, damn it? Do you think minds like yours are common? We *share* this business now, and that makes us friends. You are the first person to come out of that elevator and really surprise me in a quarter of a century. And soon, when the word gets around that I've broken faith, people will stop coming out of the elevator. You think like me, and I can't afford to lose you." He smiled, and the smile seemed to melt decades from his face. "Hang on, Dorothy," he said, "and we will comfort each other in our terrible knowledge. All right?"

For almost a full minute she concentrated exclusively on her breathing, slowing and regularizing it. Then, tentatively, she probed at her emotions.

"Why," she said wonderingly, "it *is* better . . . shared."

"Anything is."

She looked at him then, and tried to smile and finally succeeded. "Thank you, Senator."

He returned her smile as he wiped all recordings of their conversation. "Call me Bob."

"Yes, Robert." ■

IN TIMES TO COME

●Our cover story next month—with cover by Rick Sternbach—is "Rings of Glory," by Thomas R. Dulski. It's a good old-fashioned adventure story with a decidedly novel idea behind it. The focus of the action, you see, is a very special ringed planet which happens to be uniquely attractive to prospectors. We have nothing very much like it in this solar system, and there aren't likely to be many like it anywhere—because it would take a very peculiar set of astronomical circumstances for it to form. But what's easy to forget in talking about improbable phenomena is that given enough chances—such as the number of star sites in a universe—even the most improbable will happen occasionally. And the most special cases are likely to create the most interesting situations for those caught up in them.

There's a good chance we'll also have a new Timothy Zahn novella based on a new kind of air transportation that sounds wildly exotic—but is actually under serious consideration for possible use in this century. And our probable fact article, by Gordon R. Woodcock, looks even farther out in the same vein; it's called, "Space Transportation: You *Can* Get There From Here!"

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STATE OF THE ART

THE NINETY-DEGREE ERROR

Joe Patrouch

About four years ago I taught a course in "Fiction." It was a generally chronological survey of the ways fiction has been put together over the last two centuries. Gogol, Turgenev, Chekhov, Maupassant, Kafka, Joyce, Hemingway—you get the idea. Occasionally, I slipped in some mimeographed SF. Three students in that class seethed with righteous indignation each time. Their attitude could be expressed any number of ways. "If I wanted to read sci-fi, I would have taken the sci-fi course." "I paid good tuition money to study *real* literature, not sci-fi." "If this is sci-fi, it can't be any good, so why are you wasting class time with it?" Not one of them ever tried to come to terms with the individual stories themselves. Each rejected the genre and therefore every example within the genre. None of them could be made to see that this was exactly like rejecting all members of the human race who had a certain skin color, or who professed a certain religion, or who had a given national heritage. The individual didn't matter to them. Their attitudes towards the group controlled their thinking.

All three were English majors.

What is there about English as a major that builds such biases into its students?

(And remember: English majors grow up to be English teachers, and English teachers make up the faculties of English departments.)

Let me tell you a secret. English departments are as uncomfortable with SF as the longtime fan who prefers to take SF out of the classroom and put it back in the gutter where it belongs. Most members of English departments look upon SF courses as necessary evils, as a giving-in to the juvenile tastes of present-day students, as temporary aberrations. Why should both former and present English majors feel this way?

And especially, why should they feel this way when English departments—and the so-called Humanities in general—are in deep trouble everywhere? "Trouble" in academia means "not enough students to justify the number of faculty on payroll." A department must attract

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a certain minimum number of students into its courses, or some faculty will lose their jobs, tenure or no. It's as simple as that.

Three years ago my Chaucer course drew three students—and my Harlan Ellison course drew forty-two. SF generally draws in the upper thirties, while this term a colleague's "Literature of the Occult" (offered as often as he can be talked into it) has fifty-five and counting.

Why are the numbers down in the traditional courses? English teachers like to point away from themselves and at television and the job market. Students watch television instead of reading, they say, and students prefer majors that lead to jobs.

But I think there is another reason why the numbers are down in the traditional courses, and I think this other reason also explains why so many English majors and teachers are uncomfortable with SF and wish it would just go away.

Something is dreadfully wrong with the way literature is taught today. Ask anyone. There is fire beneath all that smoke of the general public's dislike for the English courses they took in high school and college.

I call this thing that is wrong "the Ninety-Degree Error."

Draw the horizontal and vertical axes of a graph. Let the horizontal read "Simple —— Complex." Story A is straightforward and understandable without help; let's call it a simple story. But story B uses literary techniques we may not be familiar with: symbolism, allegory, ambiguity; let's call story B a complex story.

On the vertical axis put "Good —— Bad." This axis charts your critical evaluation of a story. According to whatever standards you use—emotional reaction, plausibility, scientific accuracy, whatever—you decide the story is good or bad, or some combination.

This is the important thing: These two scales are mutually independent. You can have a bad simple story and a bad complex one, a good simple story and a good complex one. Calling a story simple or complex is not evaluating it.

But something peculiar has happened in the way stories are selected and taught today, something most teachers and students don't seem to notice. The Ninety-Degree Error.

The vertical axis has been rotated ninety degrees to correspond with the horizontal axis. "Simple" has become "bad," and "complex" has become "good."

This has happened for historical, psychological, and economic reasons.

Historically, an earlier revolution in the way literature was read and taught in the schools shifted attention away from biography, from history, from cultural context, to the text itself. According to the apostles of the New Criticism, the only authoritative thing was the text itself. Nothing extraneous to the text was allowed any weight in the interpreting of the text. Even the writer's own statements about what he had written were held to be no more or less significant than the arguments of a critic.

This thinking led inevitably to something called in the trade "the Intentional Fallacy," which decrees that an author's intentions are to be considered

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irrelevant to his results. If in a letter Henry James says he intended to accomplish X in a story, and if a critic later argues that instead he accomplished Y, then to take James's intentions as authoritative would be fallacious. The writer does not always do what he intends to do. His results—as explicated by the critic—are what counts, not his intentions.

(Students in composition courses often begin discussions of their essays with, "What I meant to say was . . . ." Their intention was not their result. Another example. If I take an airplane with the intention of going to New York, and the plane is instead hijacked to Havana, my intention of arriving at New York does not make Havana New York.)

The Intentional Fallacy protects the critic from contradiction by the writer. It is an invitation to arrogance.

Isaac Asimov recounts an anecdote that strikes me as a *reductio ad absurdum* of the Intentional Fallacy. Having listened to a critic analyze one of his stories in a public lecture, Asimov went up afterwards and informed the critic that none of what he saw in the story had been in the writer's mind while he wrote it. When the critic asked how he could possibly know that, Asimov replied, "Because I am the author." To which the critic responded, "Just because you wrote the story, what makes you think you know anything about it?" As Chaucer would say, "Such arrogance is not worth a bean."

But the arrogance of some literary critics is not the point here. The point is that because of the Ninety-Degree Error too many literature teachers tend to make two errors—I almost said "critical errors"—that have alienated them from the general reading public: since only the complex is good, they work only with the complex or they struggle mightily to make the simple seem complex.

Historically, this is due to an over-reliance on the New Criticism and its corollary, the Intentional Fallacy. Psychologically, this over-emphasis on the complex at the expense of the simple is even more easily understood. We all want to feel that what we are doing is important—yea, even necessary. But if my students are reading texts they can understand and enjoy without my help, then of what use am I? How can I feel that I am doing something important?

Surely the economic side of all this is clear. If the teacher isn't needed, he won't have a job. The evaluative "good or bad" becomes the pedagogical "good" (because it is complex enough to justify my presence in the classroom; it makes me useful) or "bad" (because they can read it on their own and don't need me; it makes me useless). Teaching "good" (i.e., complex) texts saves my job, while assigning "bad" (i.e. simple) texts costs me my job—so long as the teacher's job is seen simply as analyzing the text itself. Complexity, complexity, *über alles*.

The Ninety-Degree Error is easily explained historically, psychologically, and economically, and I think it goes a long way towards explaining why so many English majors and teachers do not want to come to terms with SF or with other forms of Popular Literature (i.e. simple literature).

Admittedly, it's really not quite so simple as all that. There is at least one

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other bias that gets in the way of an appreciation of SF among people with English major educations—or with Humanities educations, for that matter. Perhaps the complexity of an SF story is not with the characterization or with the narrative point of view. Perhaps the complexity is with a cosmological idea like black holes or like time dilation at near-light speeds. Reading and understanding such a story would require the English or Humanities major to know some physics or some astronomy, or even some math. This is not likely.

While Humanities people are constantly trying to get Science people to take more Humanities courses—to civilize them, don't you know?—it seldom works the other way. Check whatever college catalogues you have available, and be careful to include *all* the Humanities requirements. You will probably find that students in the Sciences are required to take far more courses in the Humanities than students in the Humanities are required to take in the Sciences. (I was present one day when a colleague voted against increasing the lab science requirement for English majors on the grounds that dissecting frogs was "icky.")

This encourages the English and Humanities major to be disinterested in science at the least, and often at the worst actively hostile towards it. A major theme in modern "real" literature is Alienation. These are stories of people who are not at home in the modern world, shaped as it has been by the mysterious forces of science and technology. These stories are most often produced by workers in a comfortable little cottage industry in American ed-

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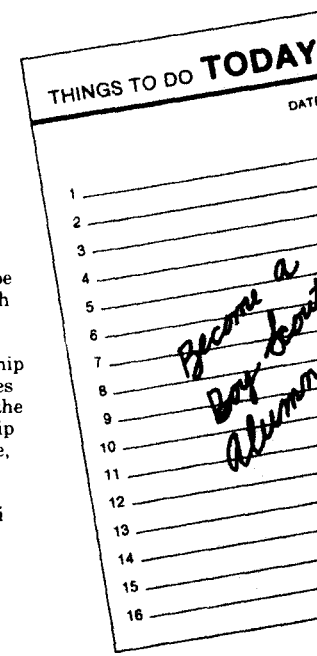

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ucation: college English teachers writing short stories and novels for other college English teachers to teach in their classes. Who would know better what sort of thing an English teacher needs? And of course the theme of Alienation would loom large in the writings of such people.

SF requires a degree of scientific literacy as well as verbal literacy, but an English major's education largely ignores the first so it can concentrate on the second.

Why did my three English majors dislike so thoroughly my bringing examples of SF into "real" literature classes? Because they had not yet learned to judge individuals instead of groups (if it's sci-fi, it must be bad), because they had been allowed during their educations to ignore science and its paramount importance in the lives of all of us in the twentieth century (dissecting frogs is icky), and because they had seen exemplified time after time the Ninety-Degree Error that for the working teacher in the classroom good literature had to be complex enough to require a teacher (if you can read it without a teacher's help, it has no place in the classroom).

As has often been said, SF is the natural literature of a technological society. The farther we have moved beyond the Industrial Revolution, the more technological society has become, and the more central and significant SF has become. There have been great literary movements in the past—the Elizabethan playwrights, the Metaphysical Poets, the Romantics. Neither Shakespeare nor Donne was taught at Oxford or Cambridge during the seventeenth century. But Murray Leinster and Jack Williamson, Robert Heinlein and Ursula LeGuin, are being taught in their century, in their lifetimes. This is not a bad thing. SF is the literature of the future in more ways than one. Looking backward, future literary historians will put SF in its historical perspective. It would not surprise me if SF turned out to be the great, the distinctive literary movement of the twentieth century.

What would an English major give today to drink a few beers with Samuel Johnson? What would the English majors of the future give to quaff a few with Niven and Pournelle? or be sm*ooo*thed by Tucker? We cannot listen to Chaucer read, but we can Ellison.

We live today among giants, and too few of us know it. My three English majors didn't. They were trapped in someone's old notes from graduate school. I hope more and more of us can escape their dreary fate.

Come. There's an SF con just up the highway, and its Guest of Honor is the envy of tomorrow's teachers and students. The con suite has a bathtub full of cold beer, and down the corridor voices are raised in song. "The Eagle Has Landed." ■

● There is no one cause more mysterious than another, if we look into it.

Leigh Hunt

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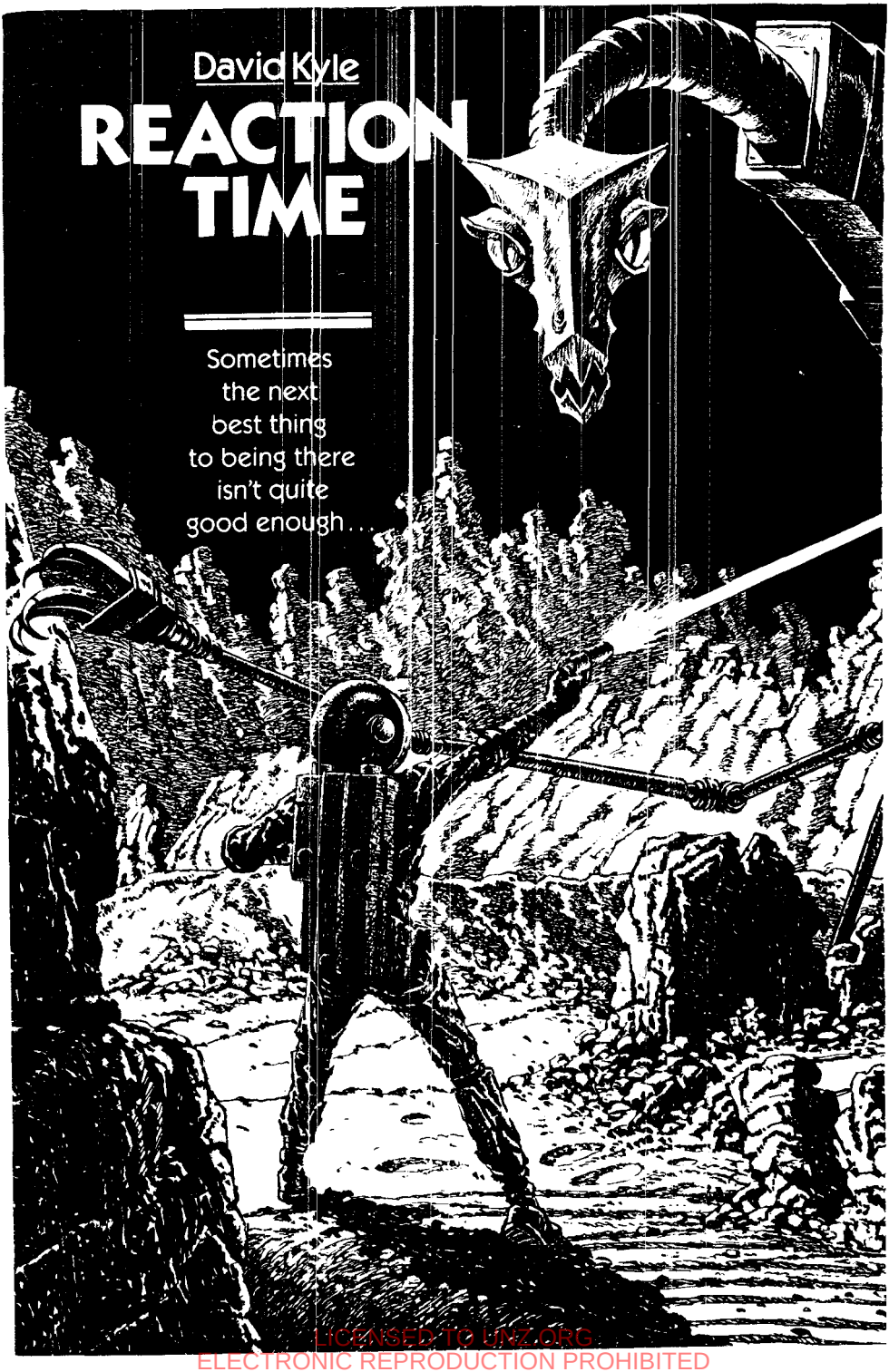
David Kyle

REACTION TIME

Sometimes the next best thing to being there isn't quite good enough...



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The metal monster was digging into the floor of the asteroid's crater when Barnesley discovered it.

Barnesley had bounded clumsily out of a crevasse, flashing his headlight before him, but distracted momentarily by his struggle with the low gravity. Then he noticed the spindly form working rhythmically a hundred meters ahead and slightly below him.

The startled spaceman, shivering in his spacesuit from the terrifying shock of finding life where there should not have been any, stumbled in fear behind some meteoric rubble and accidentally dislodged a wave of granular dust. A small avalanche flowed like gray molasses down the gentle slope and came to rest around the monster, partially engulfing its numerous spidery legs.

Barnesley lay in a shallow trench behind a thin screen of crusty clods where he had softly fallen. He kept still, afraid to expose himself, hoping that he would not be noticed. His radio-TV transmitter, the small package fastened to the left side of his helmet, was out of reach, knocked off in his excitement and carried away, bobbing slowly, on the lazy, silent tide of sliding stones.

At first the monster paid no attention to the flood of rocks, but then it suddenly stopped its scratching in the asteroid's debris and straightened erect. It was tall, very tall, unfolding upward like a skeletal flamingo or some weird scaffolding around an electronic totem pole. It was so unexpectedly tall that Barnesley, in his horror, found that his hiding place was revealed. He lay there unmoving, praying that he wouldn't be noticed.

Barnesley had never seen such a thing before. He could identify certain anatomical parts of the creature: head, limbs, eyes, mouth, fingers, torso. There was no doubt it was intelligent; the way it had been clawing through the rubbish of rocks, pausing now and then to swivel its head back and forth like a grayish-black, metallic praying mantis, made it seem alert and dangerous.

At last it noticed Barnesley, for it stopped its radar-like sweeps with its head and upper body, leaving them directed at his position. Then it began to telescope its neck and to retract the numerous spines and appendages with which it had a few moments before so suddenly bristled.

The alien communicated with his superior, "Sir, this asteroid was listed as uninhabited. This is not true. There is a four-legged creature on its hind legs which has interrupted my mining."

"Exercise caution and take whatever action you deem necessary," said the superior.

The monster took several giant, spidery strides toward Barnesley, its head swinging forward on its tube-and-rods neck, so that he could observe it quite closely. The head was almost reptilian —long and angular with flat, jointed planes—and the jaws were grim, sharp angles with serrated edges. The eyes were hooded and slitted, suggestive of a frog or snake. The whole appearance was ugly and evil, and Barnesley felt that Death was gathering itself together to pounce on him.

Barnesley stopped playing possum. Those eyes were looking directly at him and there was no salvation in pretending

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that he wasn't really there, so he jumped up and quickly slammed with his fist the button on his chest. Automatically the dit-dah transmission began of his emergency warning signal to the one other Earthman on this barren world. Their spaceship was not more than half a kilometer away, with Ed "Iron" Hammer inside. Hammer would be alerted, but Barnesley needed his own communicator to coordinate his retreat with Hammer's help. The transmitter pack still lay there five meters away, a third of the distance to the machine-like beast.

"Sir, I detect radio frequencies," said the alien, "but they form merely a repetitious pattern."

"Relay them to us," said the superior.

Barnesley, in all his years of wandering around the solar system, had lived in a dead environment. In space, life had been limited to his partner and friend Hammer, plus an occasional space wanderer or governmental-industrial corporation employee. He had never met an alien, he didn't think any really existed, and he never expected to meet one. Never before had Barnesley been so afraid. The unknown had finally overwhelmed him because he had lazily grown so unprepared.

A slender limb grew rapidly out of the right side of the creature's body until it had extended to an incredible length of some twenty meters, suspended waist-high along the inner edge of a deep fissure on Barnesley's left. He instinctively flinched sideways. The whole organism—shell, bone, horn, or metal—was gently shifting toward him. Another of its arms had started to reach for his fallen radio-TV pack. In terror, Barnesley hurled a stone at the monster, the sluggish movement tipping his underweight body backward, and although his retreat to the ravine in the face of the crater was not cut off nor even seemingly threatened, panic was insisting that he rescue that transmitter.

He did. He was turning to go back when he was killed.

The narrow rods of the alien's arm with its needle fingers had speared him with ease.

The scene was a bizarre tableau in the empty silence of space: the monster frozen immobile, an appendage pinning the dead man to the exact spot from which he had rescued his wireless.

Tiny crystals of blood and water drifted like frozen dew to the crater floor.

On Barnesley's chest a tiny red light tranquilly blinked its message that the call for help was still being broadcast.

"The creature has been killed," said the alien.

"Was it necessary?" said the superior.

"No. Death was accidental, due to a time lapse. The radio frequencies, however, are still active, repeating a coded pattern. What shall I do?"

"Give me a detailed report, but continue mining."

When Hammer received the emergency signal from his partner, he was lying on his back on his bunk listening to the recorded music which was his one great relaxation. At the first grating blast

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of the alarm horn, he made a flying leap to the radio and attempted to make contact. There was no picture, not even a carrier wave. He had no trouble turning the system on remotely, but except for the power hum and the darkly glowing screen, he heard and saw nothing. He called frantically, at the same time struggling into his spacesuit, noting the direction of the signal on his finder. The hum of his radio-TV receiver stayed placid, but that harsh and frightening warning from the other independent system continued to blare. Then the regular transmitter hum squawked and went dead. The horn blasts, however, did not stop.

Hammer bounded to the airlock, grabbing up a flare pistol on the way, and was finishing his buttoning up while the air was being exhausted back into the storage tanks.

He was on his way to Barnesley's position within six minutes of the first sound of trouble.

It took Hammer ten minutes to crawl and bounce over the pitted terrain of the asteroid and reach the entrance to the crevasse where Barnesley had gone. The trail had been easy to follow once he had left the harder surface near the ship.

When Hammer came out of the side of the crater, the monster stood only thirty meters in front of him. He was so fascinated that he didn't see Barnesley's body, which had been partially covered by another slide of rubble dislodged when the dead man fell.

Hammer began to breathe even harder than from his rapid journey and he automatically flipped on a richer mixture of oxygen. His hands were trembling and his legs were shaking, but he didn't give ground. There was a slight hazing inside his face plate from the film of moisture which had quickly spread over his skin.

My God, Hammer thought, *an alien!*

"Barney!" he called, not moving his head, keeping his gaze straight at the head of the monster. "Barney!"

He called and called, standing there stiff, but no answer came.

The tiny fan in his helmet, on maximum power, was clearing up the haze when the monster's head began to move. It swiveled slowly on its spindly neck until it was aimed straight at him. The slits across the bulbous eyes seemed to open wider and begin to glow.

Hammer fumblingly stuck the flare pistol on one of his belt hangers and raised his hands above his head. The gesture was supposed to be a universal greeting of friendliness.

"We want to know more about the dead creature," said the superior, "so you will examine its corpse."

"Sir, the situation has changed. There is another which has appeared. My sensors suggest it is looking for its companion."

"Is it attempting contact with you?"

"Not yet, sir."

Holding his stance, not quite balanced, his arms starting to ache, Hammer studied the creature. Without any doubt, it was animaloid. There were many slender, jointed legs, six or eight, at least three principal arms with pincer claws, along with a whole series of smaller, more specialized appendages. The body itself was a complex mass of

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thin bones or rods with many curved or sharply planed chambers in and around them. The head was frightening—wedge-shaped with a snapping turtle jaw, plated with shiny charcoal black scales—and the snake eyes were sinister peering at him, undeniably alive with an inner power.

Hammer lowered his arms just enough so that he could rest his elbows against his sides.

"I'm a friend," Hammer said, his transmitter still on Barnesley's dead frequency. "I'm from the planet Earth." Despite his terror, he felt a twinge of ridiculousness.

"I'm a friend. I hope you're a friend." The monster did nothing except stare at him. "Perhaps you're not alive. Perhaps you're just a machine." The idea gave him a bit more confidence. "Seems to me you might be no more than a fixed installation." Encouraged by that theory, Hammer began to inch backward.

"Sir," said the alien. "The second one is standing in front of me, attempting visual communication. I am responding by mimicry."

"Your response is proper," said the superior, "but too much delay makes visual interchanging of information impractical. Keep your reactions minimal."

"It hasn't seen the body yet."

"Point to the corpse. But don't seem hostile."

Hammer moved cautiously backward, eyes riveted on the terrifying head. He stumbled and fell and awkwardly picked himself up to keep moving away, but his own eyes never turned from the monster's reptilian ones. He had gone hardly two meters when the "fixed installation" began to move. One of the larger arms came down and brushed the ground, scattering some dirt.

Hammer saw Barnesley's body then.

"Good God!" Hammer said. "Barney!" Some of the dirt had stuck to the claw and wrist joint because, he noticed for the first time, the end of that arm was coated with some kind of muck. He recognized, with a sickening lurch of his stomach, that it was congealed and crystallized blood. Yes, now he could see the hole in Barnesley's back. Barnesley could not answer. Barnesley would never speak to him again.

Doubts were swept away from Hammer's mind about the benevolence or malevolence of the creature. Whether by malice or by indifference, the thing had struck from behind and had killed his closest, perhaps his only, friend. His first concern was not to have the same fate overtake him. Next, if he could, he must kill or contain the murderer.

"I am receiving an undecipherable transmission from the creature," the operator said. "It seems friendly. However, it has not yet seen the dead body. My gesture of disclosure, about to be noticed, should correct that."

"I have checked your reports," said the superior, "and I have seen your pictures. Your visitors can be from planet three of the system, their immediate identification disguised by their protective clothing. They may be human beings. Your situation is being projected on a screen for a team now organized to assist you."

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* * *

When Hammer saw the body, he acted. There was no hesitation. As soon as he comprehended the fact that Barnesley's corpse lay there practically at his feet, he made a decision. He depressed the firing buttons of his jump rockets, at the same time leaping upwards, so that he sailed backward high over the edge of the crater.

Immediately on touching ground with his feet, driven downward by the thrust of his jets, he was loping unsteadily, unseen, towards his left. When he figured he had sufficiently outflanked the enemy, he risked a quick glance over the rim. The creature hadn't moved, but its head had once more begun to swivel around from side to side.

"Sir! The human being has panicked and is fleeing."

"We are watching," said the superior. "We have the frequency radiated by its receiver. We have a brief message prepared. Transmit it. Be on the defensive. Try to keep yourself facing the being."

For many minutes Hammer kept on the move, peeking over an edge of rock from time to time at the spindly creature.

A burst of static from his receiver suddenly hit his ears. Some place down there out of sight on the crater floor, Hammer quickly rationalized, Barnesley's transmitter was open and heating up into a noisy malfunction. He wanted no distraction now. With no hesitation, he quickly snapped off his receiver and the staccatos of electronic notes from the alien's message ended inside his helmet.

Hammer continued to move, circling, doubling back, risking a brisk look from time to time. The thing played the game somewhat itself, moving erratically around the flat circular floor of the crater, peering toward the ridges and into the crevices, knowing itself to be stalked and searching out the best way to meet the challenge.

"The thing's intelligent," Hammer mused calmly to himself, "but it's incredibly slow in reaction time. I must seem like a streak of light. It must be worried crazy about what I plan to do. It must know I'm up to no good—and it's right."

So far it had shown no weapons. Which made them even, because the nearest thing to something lethal was his flare pistol. Could he blind its eyes? Probably not. What then? And suppose there were more? Suppose reinforcements were on the way? That would explain its stalling tactics.

Hammer felt he had to do something decisive—to take some positive step—while he still had the initiative. The idea that he could simply hurry back to his ship and leave was unthinkable; he was a man whose entire reason for living was to seek out risks and danger. The testing of his prodigious courage was the motivation of his existence. Perhaps Barnesley might have argued him into a more reasonable course of action. But his friend Barney was not around now to plead for caution.

With only the flare pistol in his arsenal he was led, logically, to build his attack around it. His rapidly conceived plan was simple. He had six cartridges.

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At six different points he would pop up above the ridge line and fire across the small crater into the base of the far slope. He took careful aim and fired his first shot. Debris tumbled down toward the monster and he watched until the dust cloud obscured the scene. It was three or four minutes before he had worked his way almost half way around, rose up behind the alien, and fired his second shot.

"A weapon has been fired at me, sir. I'm being attacked."

"So we see," the superior said. "Just one shot. Perhaps it's just a warning. The weapon doesn't seem dangerous."

For many, many minutes he crawled and jumped, tumbled and ran, assisted by frequent blasts of his jump rockets, breaking up any pattern to his movements. His appearance, now from this angle and now from that, forestalled any countermeasure at the vulnerable moment when he was completely exposed. Each time the monster, all its appendages fully extended, was helplessly facing in the wrong direction. After the fourth and fifth shot, it seemed to gesture more and more wildly, almost frantically. The thing now seemed to understand the theory of his attack.

"Four shots," said the superior. "You have suffered no damage, but the beast is trying to immobilize you. Is the communicative channel still off?"

"Yes, sir. I'm trying to signal you, [illegible] but my symbolism isn't [illegible]."

* * *

When Hammer bounced above the rim and fired his final shot, he gave a warwhoop for joy. Each of his previous flares had plunged into the powdery, pebbly debris before exploding, and each had sent down a small avalanche. With each successive one, the creature had been forced into a dance to keep its legs from being trapped, until finally it had gone from frying pan to fire; it had lost its balance on the fifth surge of rubble so that it set its legs directly on top of the moving rocks of the sixth and final one.

It fell over on its back.

Briefly its legs continued to thrash about, but abruptly it was still.

Hammer hoped, with no trace of remorse, that it had died.

"Sir, I've been upset. I'm out of action. What are your orders?"

"So we see. Shut down your systems and await our evaluation."

When the climax came, the fatigued Earthman decided immediately to return to his ship. He needed to rest his exhausted body and to replenish his critically low oxygen supply, and there was plenty of time later to examine the remains of his slain monster and to search for the corpse of Barnesley. With his victory, however, came relaxation—and carelessness. He had been leaning on one of the sharp, bare spires, and without thinking, because he was so tired, he stepped over the rim onto a flat ledge for a better view. The ground gave way beneath his feet. Before he could scramble back, he had slipped into the loosened soil of the slope and floundered halfway down.

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At first he didn't realize his predicament, for he had been merely jarred by the bouncing of his slow-motion fall. But when he had tried a dozen times to climb the fluid debris against the upper steepness of the walls, he became concerned. His jump rockets were exhausted; his tired legs, encumbered by his bulky suit and unable to push strongly against the churned floor and sides of the crater, could not now propel him upward with much force. The only way out was through one of the crevasses. He groped his way around the entire base of the encircling rock, his coordination failing so much now that he would turn head over heels or smash sideways or upside-down into the asteroid. He found no crevasse opening. Every one had been blocked by the avalanches he had caused.

Hammer wearily made his way to the rubble-strewn center of the crater and sat down contemptuously on one of the legs of his fallen foe. He noted with detached interest that the material was metal. It had been a machine, after all. An intelligent, ambulatory machine. The mystery of its existence only interested him mildly; he would never know the answers and he didn't care because, now that he knew what was going to happen to him, mental and physical fatigue had stripped him of the remnants of his vitality.

He leaned back and closed his eyes for the last time. He knew that within minutes he would be unconscious and within hours he would be totally and irrevocably dead.

"We have made our decision," the superior said. "Re-activate. Scare the human being off your machine with some noise. Then eject a contact package, with all frequencies operating."

"Yes, sir."

"As soon as the human being is off your machine, and the contact package is ejected, begin a slow-count self-destruct. Keep a visual on the human being as long as possible. We will monitor you, but as this is your machine, you will be given the courtesy of its destruction."

"Thank you. But must we really destruct?"

"Yes, we must. We are too many millions of kilometers away for rescue or salvage. One of their ships may arrive at any time. We are not yet ready for personal contact with human beings and we cannot let one of our machines be captured and examined. The contact package is the correct method."

"Sir, I am obeying . . ."

"We are monitoring."

"Sir, the signals have been sent by me. We are now no longer in control. The automatics have taken over."

Hammer opened his eyes. He felt a vibration beneath his back. The machine was not dead. The vibration was growing like a whining noise within his helmet.

A fighting spirit swept over him and he no longer felt like abandoning life. Curiosity itched again within him. What secrets did this machine hold?

Wearily he pushed himself upright and off the machine to stop the noise, and began an examination of the metal monster trapped in the rubble at his feet. Dust was dancing upon its smooth surface as it hummed once more from life

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result. Only some of the appendages were buried. Its great bulk was exposed, and he saw easily that it was an intricately built piece of high technology, bolted and pinned together in a knock-down construction, ideal for salvage even on a single space rover such as he.

It was apparently a telefactor, certainly not an alien being as he had imagined. It was larger and more complex than any robot he had ever seen, weirdly designed, with no identifying marks. It had to be one of the secret machines of the richer exploratory corporations which were beginning to spread out through the planetary system. Hope grew within him that watchful technicians would come and save him.

As he poked in among the gears and levers searching for a clue to its origin, a square box, smoking blackly and glowing incandescently, unexpectedly was ejected from the machine. It arced high in the airlessness and, under the low gravity, fell gently at the inside base of the crater.

He shuffled over to it. The smoke and light were obvious signals, suggestive of an emergency marker or space buoy, and his hopes grew higher. No doubt it was emitting signals on all frequencies, too, he instinctively felt, but he was too tired to turn his own receiver on immediately as a test. As he stood there staring at it, the realization came to him that he was so fatigued that he had lost his ability for coherent thought. The light and smoke stopped and dispelled his sense of danger. Even as he thought he shouldn't do it, he automatically bent over and picked up the box. It weighed only ounces, and bits of meteoric iron dust magnetically stuck to it.

As though on cue, as he retrieved the box, he saw movement from the machine which he had cautiously turned himself to face. The legs were contracting, folding up and churning the stones and dirt. One of the central assemblies of the torso vibrated madly, shaking down the dust from its flaking black surface like wet, black sleet off an umbrella. By the time he had moved back as far away as possible, the huge metallic bulge was cherry red. It was blindingly white when he scrambled behind some rocks. Then there was the noiseless flash of its self-destruction and the entire machine vaporized.

Dizzy from the lack of oxygen to feed his excited and exhausted body, bewildered by the complete absence of any explosive force, Hammer fell frontward over the box he hugged. He had no thought of danger, no worry of being burned or contaminated. He simply knew that the box was important.

How long would it take for the box to work? It had to work soon, very soon. He could not get back to his ship. His self-sufficiency was gone, he no longer controlled his own destiny, and now, finally, he needed help or he would die. The black box would bring him rescue.

Hammer lay in the dust, in foetal position, wrapped around the black box. He imagined his rescuers were on their way. Hurry, hurry, he thought. He blocked from his mind the fleeting idea that the box was not calling for help and that no one for a thousand years would find him or that box or know what had happened there in the crater of a small asteroid with a strange, glassy depres-

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sion pressed into the middle of the crater floor.

"Our machine is destroyed," the superior said, disconnecting the wires from the operator's eyes. "You had a difficult duty. Go get some rest."

"The last picture showed the contact box in the hands of the human being," said the operator. "It was only then that I activated the destruction. I am worried that my machine may not have been completely destroyed. I am also worried that the human really is trapped and will not get the box to the rulers."

"Do not worry," said the superior. "We judge our technology was perfect. As for the human being, he will remember to take the jumping harness from his dead friend and make his way over the crater walls. It will not be long before his superiors will have the knowledge and instructions in our black box. We will now prepare to hear from them."

"Are they to know our position? Will they learn where, in the asteroid belt, we have our principal outpost?"

"No, although they should deduce from the reaction time our general location. However, plans are already underway to double our distance by shifting our planetoid thirty or forty million kilometers."

"But they will contact us, won't they? For certain?"

"If we don't hear from them shortly, it will be because it is their choice. That being so, we will ignore them and go our separate ways, until, perhaps, some other time." ■

● To admire only our own successes, as if they had no past (and were sure of the future), would make a caricature of knowledge. For human achievement, and science in particular, is not a museum of finished constructions. It is a progress, in which the first experiments of the alchemists also have a formative place, and the sophisticated arithmetic that the Mayan astronomers of Central America invented for themselves independently of the Old World. The stonework of Macchu Picchu in the Andes and the geometry of the Alhambra in Moorish Spain seem to us, five centuries later, exquisite works of decorative art. But if we stop our appreciation there, we miss the originality of the two cultures that made them. Within their time, they are constructions as arresting and important for their peoples as the architecture of DNA for us.

JACOB BRONOWSKI, *The Ascent of Man*

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"My sister has leukemia."

It's unfortunate, but at least one child in each of these pictures learned to say these words early in life. They understand that their sisters have to undergo often painful treatments in order to get well.

They may not know all of the big words connected to the disease --acute lymphocytic leukemia, remission, chemotherapy, linear accelerator, etc., but they know more about this terrible disease than most children their age.

St. Jude Children's Research Hospital has become one of the top ten cancer research centers in America today and treats children from all over the world free of charge. For more information on this unique hospital and how you can help the research continue, please write St. Jude, P.O. Box 3704, Memphis, Tennessee 38103, or call 1-800-238-9100.

Danny Thomas, Founder

ST. JUDE CHILDREN'S RESEARCH HOSPITAL

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the reference library

By Tom Easton

The War Hound and the World's Pain, M. Moorcock, Timescape, $12.95, 240 pp.
The Red Magician, L. Goldstein, Timescape, $2.25, ? pp.
Century's End, R.M. Griffin, Bantam, $?, ? pp.
Syzygy, F. Pohl, Bantam, $3.50, ? pp.
The Golden Space, P. Sargent, Timescape, $13.95, ? pp.
The Nowhere Hunt, J. Clayton, DAW, $2.25, 208 pp.
Tintagel, P.H. Cook, Berkley, $2.25, 210 pp.
Spacetime Donuts, R. Rucker, Ace, $2.50, 196 pp.
The Soul Eater, M. Resnick, Signet, $2.25, 151 pp.
A Life in the Day of . . . , F.M. Robinson, Bantam, $2.50, 262 pp.
Shadows of Sanctuary, R.L. Asprin, ed., Ace, $2.50, 338 pp.
Dragons of Darkness, O.S. Card, ed., Ace, $6.95, 351 pp.
The Essential Guide to Home Computers, F. Herbert with M. Barnard, Pocket, $5.95, 304 pp.

Violating your expectations, Dear Readers, I begin this month's column with fantasy, three highly readable novels that differ greatly in the kinds of fantasy they deal with. One is even rather *Analog*ish, using witchcraft—*aka* psi—in a more or less realistic future setting.

First—and first only because the author's name is well known—I offer you Michael Moorcock's **The War Hound and the World's Pain.** In it, Graf Ulrich von Bek deserts the battlefield that is Europe during the Thirty Years' War and comes upon an empty castle. There he rests until the castle's owner appears. That owner is Satan, and he asks von Bek's willing aid. Satan wishes to be reconciled to God, but the two aren't talking (understandably). However, if Satan can only find the cure for the world's pain, which he believes to be the Holy Grail, he may get what he

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wants. The trouble is, he needs a human agent, von Bek. As a reward for success he promises to renounce all claims on von Bek's soul, which is already his.

The search takes von Bek on a trek through a series of shadowlands set to one side of the Earth we know. There he fights demons and men sworn to Hell and rebelling against Satan as Satan once rebelled against God. The odds against him seem insuperable, and the fate of humanity inevitable.

"Should Lucifer be defeated. It will be Armageddon. . . . Mankind will perish. . . ."

"But Lucifer does not wish to make war on God," I said.

"The decision could be Lucifer's no longer. Nor God's. Perhaps both have lost their authority."

"And the Grail?" said I. "What part can the Grail play in all this?"

"Perhaps none at all," said Groot. "Perhaps it is no more than a diversion. . . ." (p. 200)

Yet the Grail *is* more than a diversion. Embodiment of harmony, it ends strife. And when it is found, Satan gains his wish in a less than obvious way. He retains his dominion over the Earth, but his mission is transmuted from damnation to salvation.

Put that in your pipe and smoke it. It reveals the end of the story, but it leaves out so much of what happens along the way that I dare to hope I have not spoiled your enjoyment.

Moorcock's point is not terribly original. I—and you—have seen it before. But the story is quintessential Moorcock in incident, in character, and in style. It has that flavor of Victorian fairy tales, a starkness of opposites, modulated by a very modern uncertainty. For relish, there is an incongruence between the expectations we bring from mythology and the truth Moorcock claims. For spice, there is a touch of sex. For sauce, there is the Moorcock wit, and if the sauce tastes much like the relish, remember that incongruity is the soul of wit.

Lisa Goldstein's **The Red Magician** is a short but excellent tale of the Nazi holocaust. Its fantasy is the magic of cabbala, cross-bred with the legend of the Wandering Jew. The story opens in a pre-holocaust, Eastern European village populated largely by Jews. They have no hint of the future, though a few of the citizens suffer ominous dreams. Into this scene steps the red-headed Voros, wandering juggler and magician. He antagonizes the local rabbi with an ill-timed prophecy and then must duel, pride against pride, over the body of the golem he has tried to raise to protect the town. Nearly defeated, he leaves. A young girl, Kicsi, witnesses the duel, and because she is intrigued by Voros, whom she has learned is an apparent immortal, she salvages the pack he abandons in his flight and secretes it in a wall of her house.

And then the Nazis arrive, with their soldiers and cattle cars and death camps. Kicsi survives, barely, until the day of liberation, when Voros reappears to nurse her back to health. They return to the village for his pack and the magical paraphernalia it contains, Voros fights another duel with the rabbi, and Kicsi finds her way onto a boat bound for America.

The holocaust is a setting. The story is one of maturation. The magic is that of puberty, of confrontation between old and new. The rabbi represents the old, the traditional, the conservative. Voros is the new. Yet he is not wholly new; immortal, he embodies the best of the past, wisdom, not blind conservatism. And Kicsi must find her own path. Pass-

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ing through the fires with the aid of Voros's wisdom, and helping him in turn, she must then leave all the past behind.

It's a good story, a warm and thoughtful one. Read it.

Russell Griffin's **Century's End** is a longer tale. It is also rather less deft in its portrayal of a world and less believable. Set at the end of this century, its theme is millennial hysteria. Witchcraft works, and witches, astrologers, palmists, Tarot-readers, etc., all serve as consultants to government and industry. One of the nation's largest corporations is Faith, Inc., whose head is an evangelist now running for the presidency. Faith, Inc., sells a "Thou Art God" sort of religion, but it also peddles a device that both intensifies the TV experience and lets the company program its customers' brains with opinions and with orders for the day. The evangelist has the presidency in his pocket.

Or does he? A writer and a witch are hired to prepare the TV special on which he will announce his candidacy. After the initial planning session, as they leave the Faith HQ, they see the candidate blown up by a bomb. Yet there he is on TV next day, talking of an *attempt* on his life. Is it all a simulation? The writer knows it just could be.

And then there is the cult that believes Armageddon is just around the corner. Its members don't watch TV; they refuse to be customers for Faith, Inc. So Faith plans and begins a war of extermination, using its ability to give people orders via TV.

And when writer and witch begin to find out just what's going on, and to seek more, they too become targets. Yet in the end, thanks to the witch's powers, they defeat Faith.

I don't believe it. Faith is all too possible, even without witchcraft. If it comes, its accession to power will be all too likely. It will dictate thought and action, suppress dissent, and rule without opposition. With witchcraft—well, Griffin lays little real ground for the *deus ex machina* that saves his future world.

And speaking of that world, it's set less than twenty years hence, but it also embodies the results of the CO_2-induced climatic warming now being argued over. The latest poop is that the trend is clear and promises climatic change by sometime *in* the next century. Griffin dates his world too close to ours. We are not about to have a continental dust bowl in the U.S. as soon as he projects. He could have solved the problem, but shoving the date back would have kept him from exploiting the millennial connection, and cancelling his dust bowl would have removed one of the forces behind his plot. I suppose the error is forgiveable, but I *do* wish for more verisimilitude. Somehow, such things bother me more than the witchcraft. Perhaps it's that it is easier to swallow a writer's story elements when they are *wholly* fictitious than when they are part real (or likely) and part imaginary. The effort necessary to tell just what we're being asked to swallow in the latter case may spoil our "willing suspension of disbelief."

And now for the pure quill, the real SF: here's a dose from Dean Frederik Pohl (A dose? Give him a hand, folks. Clap!). It's **Syzygy,** billed by Bantam as "closer to the mainstream than anything he's done up to now." Maybe so. *Syzygy*'s future is only 1982, and the publication date is January 1982. The timing, it seems clear, is intended to mesh with the predictions for 1982 of disaster due to the alignment of the

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major planets on one side of the sun (a la *The Jupiter Effect*).

The story? A distant space probe fails mysteriously, and the media begin to make noises about the Jupiter Effect and little green men. A real estate agent seizes the commotion to drive property values down—he intends to make a killing, and if he has to invent a new religion to do it, he will. An insufferable geologist and a beautiful space scientist lead the effort to make rational sense of what is really going on. The varied cast adds terrorists and gangsters, and as their paths cross and recross they weave the net that is the story. It's a strong net, too, for most of the characters are strongly believable.

It turns out that there is a Jupiter effect, if not the one we have been told of, and it did destroy the spacecraft. California does suffer disaster, though really it is only the seasonal rain and mudslides. As both emerge, Pohl offers a parable of our times, a moral tale concerned with the responsibility of the prophet:

> In 1976—there was a hurricane watch along the Atlantic. . . . All the beaches were full of people —
>
> Someone in the national bureau had to make a decision. Should he warn the people? If he failed to warn them . . . hundreds of thousands of people [might drown]. If he did warn them, and they left, and the hurricane stayed offshore, he would have cost the . . . merchants millions . . . of dollars . . .
>
> "And there [were] only so many bridges . . . even with the warning many, many people would have died."
>
> "What kept coming back into his mind was geology, because geology was what he knew. But the problems were not scientific! They were moral."

The issue is real. Those researchers who are now trying to develop ways to predict earthquakes face it every time they think they know when and where a quake *might* happen. Do they dare to speak? What are the hazards of a wrong prediction? Of a *right* one? (And not least among the hazards is that of gaining a reputation for crying "Wolf!")

Pohl seems to have taken as his target the hysteria and panic a prediction of disaster, right or wrong, can cause. At least, that's what Bantam's Tappan King said in the letter that accompanied the galleys. I suspect Pohl's real target is the opportunists (the real estate broker) who do not really believe the prediction but do choose to exploit it by encouraging panic for their own ends. (Doesn't that mean Pohl is targeting himself, too?)

What makes the book SF and not mainstream? The key is largely in the explanation for how the spacecraft that began the story was snuffed and in the serendipitous discovery that follows from that explanation. Perhaps, just perhaps, says Pohl, we can survive our own soft-headed foolishness and reach the stars.

In **The Golden Space,** Pamela Sargent posits immortality, with rejuvenation. The tale begins some centuries after the Transition, when the old order passed in violence. It has begun to emerge that Homo sap is less than perfectly suited to immortality. The first flush of released creativity has long since faded, and now people are content to protect their lives, to avoid risk, their minds sunk in ancient ruts. The only ones who seek novelty at all are the biologists, and they aim no higher than the development of new toys, such as elves and mini-elephants. One biologist, however, recognizes the problem and undertakes to design a kind of hu-

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man who is not a slave to emotion, a hermaphrodite who can rely on reason. This Merripen Allen gathers a corps of parents, has them produce zygotes, engineers the zygotes to fit his design, and provides an enclave in which his chosen parents can safely raise their children.

Are Allen's creations the cold, unfeeling machines of so much past SF? Not really. They feel, if not at all in our familiar way. They judge things and events in terms of sense and usefulness, not of a thrill in their nerves, and they delight in the exercise of their reason. They learn with the same vigor we play; indeed, for them learning *is* play. They are the ultimate self-actualizers.

That doesn't sound so bad, does it? Yet the story's "normal" humans fear and reject the new model. They urge exile. They try assassination. They revile. And when the children, grown, choose to scatter across the world, to live among their enemies, it seems the height of foolish courage.

But this isn't the whole story. The book actually seems more of a collection of novelettes than a novel (two of its five sections *have* already seen print). How do the parts fit together? The first is the one sketched above. The second shows the immortals' fascination with death. The third demonstrates how poorly children fit into this world, over-protected and manipulated. The fourth reintroduces Allen on his search to learn what has happened to his children in the past centuries. The last is a vignette that twitches aside a curtain on a scene that suggests a very different human species—and not one descended from Allen's children. Allen was not the only biologist to play god; another appeared in Part Four, with more grandiose and self-serving dreams, and it seems it is his creations that now bless the Earth.

The parts connect, but there is only a little flow of thought throughout the book. We therefore cannot use the bestseller jargon and call it a "page-turner," but the story is good: warm, moving, and thought-provoking. We expect no less of Sargent; ever since *Cloned Lives*, she has been pleasing readers in just this way.

I recently read that *eros* (sexual love) is the driving force of human endeavor. Sargent says that with immortality this fades. Then, for many, the fear of death takes its place; for the rest, or for some of them, the replacement is *agape* (brotherly love). I don't believe we need to look for such a situation to give *agape* its proper place in human affairs. Can't we say that it lies now behind our greatest achievements, from revolution (American, French, even Russian) to Comsats? Do we do these things because we are on the make for sex, or for its cousin, power? Or because we truly wish to better the lot of our fellow humans? The answer must be the former sometimes, of course, but I suspect the latter is true more often than many of us would like to believe. There *are* such things as saints, after all.

The end of my allotted space is now in sight, and I still have a few books I'd like to say a few short words about.

Jo Clayton's latest installment in the saga of Aleytys and her symbiotic artifact, the Diadem, is **The Nowhere Hunt.** A hive species has lost its queen, in suspended animation, on a savage planet where electronic devices fail to work. Aleytys must rescue the queen; her reward will be a ship of her own with which to continue the quest for her son and her heritage. I've praised this series before, calling Aleytys a "total heroine"; this time, she seems less compelling, perhaps because she conquers too easily.

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Paul Cook's **Tintagel** is readable and intriguing. The world is afflicted by a bacterial plague that makes people vulnerable to music—if they let themselves go with the tune, they vanish from this world's ken into a dream world. A very few people are able to go and return at will; they are the "Stalkers," who have the job of selecting whom to retrieve. Retrieval itself is simple—anesthetize the target, and he pops back into the "real" world—but it does provoke my main objection: if anesthesia will bring one back, then why won't simple sleep, or a knockout punch, or any other of the unconsciousnesses to which we are prone?

Because then there wouldn't be a story—that's why. As is, the plot is one of love and power politics. I won't give you any details, except to say that the schemes of the villain are not entirely unlikely, that I like the characters, and that the plot is an adequate support for Cook's most interesting achievement—the creation of a series of dream worlds that match various pieces of music.

Rudy Rucker's **Spacetime Donuts** uses quantum theory/speculation to breathe new life into the Incredible Shrinking Man: shrink far enough, and you come back as a giant; each subatomic particle within us contains within it our whole universe. The story is one of rebellion against a computer-ruled utopia where life is sterile and futile and, says Rucker, there are only two classes: plugged-in Dreamers and questionnaire-filling Drones. Yet there are so many exceptions to his generalization about his own creation that one gains a sense of sloppiness and inconsistency. The style is reminiscent of the *Illuminatus* trilogy and *Schrödinger's Cat* (both by Robert Anton Wilson), but Rucker is not Wilson, and his looney tunes are not nearly as entertaining.

Mike Resnick's **The Soul Eater** is a tale of obsession: Hunter Nicobar Lane meets the Dreamwish Beast, or Starduster, a living plasma with the power to project its feelings. Initially he leaves the Beast alone, continuing on his business, but later encounters lead him to abandon all prey *but* the Beast and to hunt it tenaciously, single-mindedly, and endlessly. The ending is both unexpected and appropriate.

As the story begins, one thinks it just another yarn of macho life on the interstellar frontier. This is a product partly of topic, partly of cover blurbs, and partly of the simple, even crude, style, and the thought persists surprisingly long for one destined to prove illusory. But illusory it is; well before the end, you will know yourself deep in the clutches of abstraction—of art, if you will. Clearly, "literature" is more than elegant prose.

Frank Robinson's **A Life in the Day of . . .** is another collection of a sort appearing more often lately. They offer a retrospective look at one writer's career, a combination of autobiographical notes and stories that represent stages of development. They are of interest to fans and to young writers like myself who can take comfort in the knowledge that their problems of poverty and frustration are neither unique nor insurmountable.

Shadows of Sanctuary is the third "communal" effort, formalizing the intramural borrowings of SF, edited by Robert Asprin. In the beginning, Asprin created the Thieves' World and a host of characters to people his setting. Then he recruited other SF writers to do the

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stories for him. The results have been three books of competently entertaining stories. The best of the lot may be in this volume: Janet Morris's "A Man and His God," wherein a mercenary, beloved of his god, rejects the deity only to return later. Morris is clearly using elements set up by others (not necessarily Asprin), but she does nice things with them.

Dragons of Darkness is a companion volume to *Dragons of Light,* both edited by Orson Scott Card, and both devoted to stories involving dragons, sometimes only figuratively. I haven't seen *DoL* (Ace didn't send me one), but *DoD* is a beautiful example of how *un*redundant stories that share such a major element can be. Many of the stories are very good, too, and a couple are actually funny.

The Essential Guide to Home Computers, by Frank Herbert "with" Max Barnard, seems aimed at all those who are at least a little frightened by information processors. It takes the reader all the way from the uttermost basics to elementary BASIC, with a pictoral version of the programming language. It also offers a Buyer's Guide, not by brands, but by features, which may make it more valuable and long-lived than most such things.

Do *you* need this book? You're an *Analog* reader, so I doubt you're scared of computers or of science. But you may very well wish for an elementary, demystifying introduction to computing. If so, this may in fact be the book for you. If not, well, consider the effect of Herbert's name on the cover. How many *Dune* (etc.) fans will read it? How many of them will then decide that, Hey! I want one of them things!

If you sell home computers, try talking your favorite bookseller into sharing a newspaper display ad with you. You might both benefit. ■

● Some thinkers deny that machine technology is viable. This is a particularly fashionable viewpoint nowadays: that Earth cannot long stand the drain on its resources, and that we must either go back to an ecologically balanced way of life, or perish....

There absolutely has been no ecological balance, ever, when humans were around. The concept of primitive tribes living in harmony with nature is neo-Rousseauistic nonsense. Stone Age hunters appear to have exterminated most of the large Pleistocene mammals. American Indians, in the days of Columbus and afterward, were wearing out their own environment. They didn't do it as fast as the white man was destined to; but they were doing it....The list goes on and on.

POUL ANDERSON

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brass tacks

Dear Dr Schmidt:

Just finished reading G. Harry Stine's "More About Those Books" in the July 20 *Analog*, and I feel somewhat disappointed in the lack of imagination shown in the responses he received. Surely anyone armed with a copy of, say, *The Next Whole Earth Catalog* or Chris Popenoe's comprehensive bibliography of *Inner Development* should be able to do better than that at suggesting alternative titles for a basic library of six books to be taken along by a small group exiled to some other world.

I wanted to pick up on Stine's assertion that *"There is no book on that general subject* (i.e., "Human relationships, improving human relationships, creating benevolent social institutions, etc.") *that has ever been written and that works to the level of reliability of the six books I listed."* So far as I know, unfortunately, he is right—though I'd like to suggest that Eric Berne's *The Structure and Dynamics of Organization and Groups* is at least beginning to break a small part of the requisite ground. And plainly there's great need for such a book, as there is for similarly fundamental treatments of several other important areas of human existence.

I'd like to propose an extension of Stine's original challenge—one intended in the same provocative spirit as his. Let's take his basic library as settled upon, along with *Gray's Anatomy*, and premise that we can take three additional books along, for a grand total of ten—*and that we can, within reason, commission qualified persons to write or compile those three volumes.* All right, then: *what are they going to be?*

Obviously, we've got to set some reasonable limits for this game. First of all, size. Let's say that, given the limited time and cargo space available to us, no compilation can be more than 1,000 pages long; and each page can contain, at the maximum, a total of 500 words or a single clearly discernible illustration. Original, especially-composed works can be no more than one-quarter that length, allowing us a maximum of 125,000 well-chosen words. Each volume, whether original or compiled, must be systematically organized, and built around either a single unifying

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theme which is capable of being *precisely* defined (terms like "politics" or "higher states of consciousness" are too vague and general) or else a linear sequence of themes, each of which develops integrally out of its predecessor by means of some clearly definable organizing principle. No knowledge, information, or insights can be included which are not already publicly available to the inhabitants of the English-speaking world—they may be obscure, but they must be real and not just products of hopeful daydreaming. Anyone who can propose a new way of organizing existing materials and synthesizing insights from them, however, is welcome to do so—in fact, that's more or less the whole idea! And, just to keep things down to a manageable size, we'd better specify that our instructions to the authors or compilers of *each* of our three volumes must be strictly confined to 250 words or less.

As an example, I'd like to see someone draw up a systematic summary of universal ecology on a chronological basis, starting with the Big Bang and continuing to the present. For each stage of universal evolution, this book would specify the determining physical conditions, as they are now understood, and show how and to what extent they *necessarily* gave rise to the next stage in development, to what extent quantumistically-determined "random" considerations were involved, and to what extent we are simply ignorant of the relevant factors and must resort to filling them in by-guess-and-by-golly. Starting with those crucial *First Three Minutes* which Stephen Weinberg has described, this account would continue through the whole grand sweep of the evolution of the galaxies, the stars, and the heavier elements—then focus in on the planet Earth and how the special physiochemical conditions here determined the parameters of organic evolution, both on the usual micro-organic basis of genetics, etc., and on the macro-organic level of ecological evolution, (the latter along the general lines indicated in J.E. Lovelock's *Gaia*). Next would come a large-scale overview of the evolution of life on Earth, with particular reference to the macro-organic influence of geophysical factors like continental drift and of ecological ones like the increasing diversification of ecosystems and the increasing proliferation of distinct ecological niches within them. There would be special focus on the familiar tale of the particular evolutionary path leading up to *Homo sapiens*; and this in turn would lead to a large-scale treatment of human prehistory and history, as it has been conditioned by sociobiological and ecological considerations. (A model treatment of it in the latter light, incidentally, is William H. McNeill's *Plagues and Peoples*; and I can think of several others which serve to complement it (so to call for this is not mere wishful thinking!).

Did that come in within my self-imposed 250-word limit? I don't know, and am too lazy to count; but I hope so. Beyond that, perhaps it's a little hopeful to think that all I ask for could be encompassed within a mere 125,000 words—but I honestly believe that all the essentials could be fitted into that length, in schematic outline form, though admittedly at some expense in readability! Double the permissible length, and I think it could be managed readably as well—at least, *I'd* be overjoyed to read it, if only some qualified person would do the writing for me. (Are you listening, Isaac Asimov?) And I honestly think that, if he or she did a good job, I'd very seriously consider taking it along as part of the ten-book library

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I'd be allowed on my interstellar exile. Besides providing an overall context to help relate together the abstract data and diagrams in Stine's selections, it would serve too as a touchstone against which to measure and account for whatever significant differences might set off my new environment from my old—and also, perhaps, as something of a bridge between the hard data of the Stine volumes and the more "software"-oriented material which, I hope, would be contained in Volumes 9 and/or 10. And as an organizing framework for the education of coming generations it would, I think, prove priceless. But perhaps Stine or you or somebody would like to disagree.

What appeals to me about *this* challenge, as opposed to G. Harry Stine's, is that it just *might* supply the kindling spark which will ultimately inspire some writer or editor to fill one of the conspicuous gaps in our existing libraries, and thereby enrich our world with something it could certainly make use of—even if none of us ever has the misfortune to be exiled into space with a *very* short bookshelf. And nary a copy of *Analog* in sight, perish the thought!

JULIAN REID

620 Cook St., #3-A
Victoria, B.C., Canada

I'm sorry we didn't have room for your whole letter; it had quite a few good recommendations. But this challenge alone should provide plenty of food for thought.

Dear Dr. Schmidt,

S.C. Sykes here—lurking behind a noncommittal byline. Would you like me to call Dixie Taylor in Red Bluff, CA and confess to her that I am of her persuasion? I happen to be out here in California for eight weeks anyway, taking a screenwriting workshop. Ms. Taylor should count how many male names she can find in *Redbook* and other female-oriented magazines. A male writer-friend muttered to me that maybe he should submit work to them under a woman's name. That's the trouble with so many feminists—they lose their sense of perspective and forget that discrimination works both ways. Personally I've never felt that one's writing acceptance was based on sex. It's the story itself that stands or fails.

As far as the science fiction field being primarily a man's domain, I guess it is. That impression was graphically illustrated for me this last year when I taught a science fiction elective at my middle school. In the two semesters the class was offered not one female-type face cropped up. Forty some-odd boys had a little consciousness-raising number done on their heads when they found out I could match them in their science fiction movie knowledge. I could even surpass them, having teethed on Tom Corbett, Space Cadet, on the radio, and grown up on heavy doses of Saturday Sci/Fi B movies—*THEM*, uncut. I don't know if science fiction simply attracts a predominantly male audience or if our culture has gently steered females to other interests. I certainly don't feel less feminine for loving the genre and I don't think any woman science fiction writer has to check her estrogen level to be sure she's still okay.

Actually, my whole point in writing had nothing to do with sexism in science fiction. I simply wanted to tell you how pleased I was with the way my story ("The Cyphertone") appeared in your August 17 issue. I was especially pleased with the illustration. I don't know who or what ARTIFACT is, but could you pass on to them my compliments and request for first bid if the original illustration is for sale?

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Thank you for giving me my first break in the writing field. You broke the Catch 22 about you-can't-get-published-without-an-agent-and-agents-don't-want-you-till-you're-published.

Noncommittally,

S.C. SYKES

I'm surprised that your SF class never drew any female students. Mine usually had quite a few.

Dear Dr. Schmidt:

A complete subject index to astronomy articles which appeared in *Scientific American* magazine between 1960 and 1981 is being made available as a public service by the Astronomical Society of the Pacific. These non-technical articles were written by prominent scientists actively engaged in the research they were describing.

To obtain a copy of the index, send a long, self-addressed envelope with at least 35¢ postage on it to Astronomy Index, A.S.P., 1290–24th Avenue, San Francisco, CA 94122.

ANDREW FRAKNOI
Executive Officer
Astronomical Society of the Pacific

Dear Mr Schmidt,

Reference John C. Rudge's letter (Sept. 14, 1981 issue) on classification of SF ideas: Four years ago George Hay suggested this for a newsletter I was then editing. He had Lisanne Norman summarise two issues of *Analog* as an exercise, but doing it as suggested was far too much work and took up too much room. I suggested devising a letter code like James White's for aliens in the hospital station stories, so that (to take one of these stories as an example) medical treatment of a teleporting dinosaur on a space station might be classified MSPHR (Medical theme, space setting, paranormal element, human characters, reptilian subject). We didn't go further because the organisation and the newsletter both folded, but it's still worth considering.

Advantages: (1) Although the system doesn't classify ideas as such, it provides a retrieval system for them. Somebody looking for inspiration on a real-world space medicine problem could easily run a search for MS-H- stories through the index and get a full list, and if the codes are well designed it should be possible to pin down specific requirements.

(2) The system is compact—it lends itself readily to card files with notched and punched edges, or to punch cards or computers.

(3) It would save beginning writers from unintentionally rewriting well-known stories, and save editors from having to read their stories and explain their rejection.

Drawback: It would be taken in some quarters to confirm the literary judgement that SF is formula writing, like Westerns or Romances. Question: If it's useful do we care?

DUNCAN LUNAN
Irvine, Ayrshire, Scotland

And is being describable to some degree by "formulas" necessarily such a bad thing anyway? Look how much more science accomplished when it reached that state than it ever had before!

Dear Dr. Schmidt:

I must disagree with G. Harry Stine's statement that The Song of Solomon is pornographic.

Portions of the Song (cf. chapters 4:1-11; 5:10-16a; 7:1-9) are an ancient epithalamium, to be sung at a wedding celebration in praise of the bride and groom. Sexuality was, to the Hebrews, one of the great and good gifts which

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God had bestowed upon human beings. The Song of Solomon is a frank and joyous celebration of the delight a man and a woman find in their physical attraction to each other. Let it be noted that the delight and the attraction are mutual.

Pornography, on the other hand, is the depiction (visually or verbally) of abuses of our sexuality. It pictures sex which is inappropriate, undisciplined, perverted, and violent. It shows acts and relationships in which mutuality of pleasure has given way to exploitation. It shows persons degrading themselves and others to the level of things.

The Song of Solomon is open, joyful, and erotic. Pornographic it is not.

NAOMI GETTY

1618 West 4th Street
North Platte, NE 69101

I personally find your definitions in pretty good accord with my own. The trouble is that one person's "open, joyful, and erotic" is another's "pornographic" and people along the whole spectrum are sure they're right—which is why most attempts to control "pornography" have seemed to me far more dangerous than pornography itself.

Dr. Schmidt,

In your editorial for June 1981 you discussed making the punishment fit the crime. I have been incarcerated in the Indiana County Prison in Pennsylvania since April of 1981 and I must state that I agree with you totally.

Many people have been released for different reasons and on legal technicalities. But more often than most, I have seen "known" criminals walk free with just a "slap on the fingers" and a warning not to do it again. I deserved the punishment I received, and am serving my time. Too many others are not.

I have been reading *Analog* for about four years, and been a subscriber for two. For the first time since I started reading your magazine, you've hit me where it hurts enough to make me stand up and say something. Thank you for waking me up, and keep up the good work.

ROBERT P. SCHARADIN

P.O. Box 606
Indiana, PA 15701

In reference to Damon Knight's "Creating Short Fiction" (*Analog*, 12-7-81, p. 99), Tom Easton complains:

"He's worth listening to. I only wish he wouldn't so often use a generic 'she'; he seems to imply that males don't read."

What a pleasure to know that at least one male is sensitive enough to know how it feels. For more years than I can believe I have been reading generic "he's" that seem to say females don't read, think, feel, understand, ideate, bleed, or indeed have any noticeable human qualities. Believe me, it takes guts to face that as long as I have and still go on seeking knowledge in the printed word. It's no wonder most women resort to reading nothing but romantic slush. At least there their existence is acknowledged.

EDNA COFFIN CHOO

1244 NE Second Avenue
Fort Lauderdale, FL 33304 ■

● Knowledge is the only instrument of production that is not subject to diminishing returns.

J.M. Clarke

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4-6 May
Eighth Annual Computer Graphics Conference at Detroit, Mich. Info: Carol Lynn, Engineering Society of Detroit, 100 Farnsworth Ave., Detroit MI 48202. 313-832-5400.

7-9 May
KUBLA KHAN TENUUM (Nashville-area SF conference) at the Executive Inn, Nashville, Tenn. Guest of Honor—Frederik Pohl; MCs, Andy and Jodie Offutt; Fan Guests of Honor—Jim and Doreen Webbert. Hucksters, art show, etc. Registration—$10 until 30 April, $15 thereafter and at the door. Info: Barbara Harmon c/o Ken Moore, 647 Devon Drive, Nashville TN 37220.

8-9 May
UNICON (Kansas City-area SF and fantasy convention) at The Inn at Executive Park, Kansas City, Missouri. Guests: Pat and Lee Killough, Rob Chilson. Info: Unicon I, 5425 N. Indiana, Kansas City MO 64119.

14-16 May
LEPRECON VII (Phoenix-area SF conference) at Howard Johnson Caravan Inn, Phoenix, Ariz. Guest of Honor—George Barr; Fan Guest of Honor—Jan Howard Finder; TM—Bill Rotsler. Registration—$10. Info: P.O. Box 14590, Phoenix AZ 85063. 602-278-1827.

14-16 May
TEXARKON-1982 (Texas regional SF conference) at Texarkana, Tex. Guests of Honor—Kelly Freas, Polly Freas, Margaret Middleton, Gordon R. Dickson, Robert L. Asprin. Registration—$10 in advance, $12.50 at the door ($6.50/day). Dealers, banquet, masquerade. Info: Texarkon-1982, P.O. Box 6643, Texarkana TX 75501.

15-16 May
SKYCON 2 (SF conference) at Asheville, N.C. Guest of Honor—Hal Clement. Info: Howard, Super Giant Books, 38 Wall Street, Asheville NC 28801.

21-23 May
TORQUE 3 (Toronto-area SF conference) at Muir Park Hotel, Toronto, Ont. Guest of Honor—Samuel R. Delany; Fan Guest of Honor—Don D'Ammassa. Registration—$10 in advance, $15 at the door. Info: Torque 3, c/o 1812-415 Willowdale Ave., Willowdale, Ontario, Canada M2N 5B4.

21-23 May
V-CON TEN (British Columbia-area SF conference) at Sheraton Villa, Burnaby, B.C. Guest of Honor—Ben Bova; TM—Michael Walsh. Registration—$10. Info: V-Con 10, P.O. Box 48701, Bentall Station, Vancouver, British Columbia, Canada V7X 1A6.

28-30 May
CONQUEST III (Midwest regional SF conference) at Continental Hotel, Kansas City, Missouri. Info: Conquest III, P.O. Box 32055, Kansas City MO 64111.

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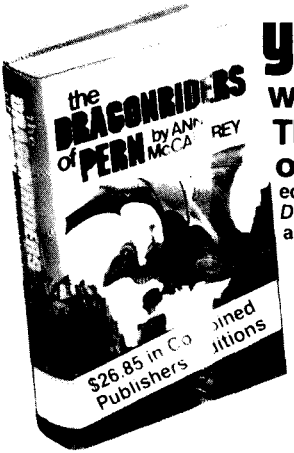

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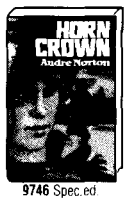

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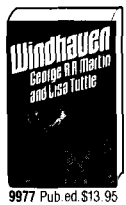

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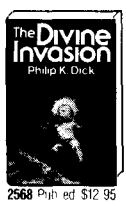

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